

# City Council of Hyattsville, Maryland

## AGENDA

**City Council Regular Meeting  
Monday, November 19, 2018  
7:30 PM**



**Council Chambers  
Hyattsville Municipal Building  
4310 Gallatin Street, 3<sup>rd</sup> Floor  
Hyattsville, MD 20781  
(301) 985-5000 [www.hyattsville.org](http://www.hyattsville.org)**

### CITY COUNCIL

[Mayor Candace B. Hollingsworth](#)  
[Edouard Haba, Council President, Ward 4](#)  
[Kevin Ward, Council Vice President, Ward 1](#)  
[Bart Lawrence, Ward 1](#)  
[Robert S. Croslin, Ward 2](#)  
[Shani N. Warner, Ward 2](#)  
[Carrianna Suiter, Ward 3](#)  
[Thomas Wright, Ward 3](#)  
[Paula J. Perry, Ward 4](#)  
[Joseph Solomon, Ward 5](#)  
[Erica Spell, Ward 5](#)

### ADMINISTRATION

Tracey E. Nicholson, City Administrator  
Laura Reams, City Clerk, 301-985-5009, [lreams@hyattsville.org](mailto:lreams@hyattsville.org)

**WELCOME TO THE CITY OF HYATTSVILLE CITY COUNCIL MEETING!** Your participation at this public meeting is valued and appreciated.

Agenda/Packet: The Agenda/Packet is available for review at the Hyattsville Municipal Building and online at [www.hyattsville.org](http://www.hyattsville.org) prior the scheduled meeting (generally available no later than the Friday prior to the scheduled Monday meeting). Please note, times given for agenda items are estimates only. Matters other than those indicated on the agenda may also be considered at Council discretion.

Americans with Disabilities Act: In compliance with the ADA, if you need special assistance to participate in this meeting or other services in conjunction with this meeting, please contact the City Clerk's Office at (301) 985-5009. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to this meeting.

Audible Devices: Please ensure all audible devices are turned off or otherwise not audible when the City Council is in session. Thank you.

Consent Agenda: Items listed on the Consent agenda are considered to be routine in nature, and are normally approved by one motion. Please note that most items on the Consent agenda have been discussed at a previous meeting. If a Councilmember wishes to comment on a particular item, that item shall be removed from the Consent agenda to "action" to allow for additional discussion.

Public Input: If you wish to address the Council during the Public Comment period, please submit an Audience Participation Form to the City Clerk prior to the beginning of the meeting. Matters identified during Public Comment that are not on that meeting's agenda will be referred to staff for follow-up or considered on a future agenda. Issues that require a response will be addressed publically at the next regular Council meeting. Speakers are requested to keep their comments to no more than two (2) minutes per speaker. Written comments or supporting documents may be turned in to the City Clerk for distribution to the Mayor and Council.

Ways to Watch the Meetings Live: City Council meetings are broadcast live on cable television channel 71 (Comcast) and channel 12 (Verizon). You may also view meetings live online at [hyattsville-md.granicus.com/MediaPlayer.php?camera\\_id=2](http://hyattsville-md.granicus.com/MediaPlayer.php?camera_id=2)

Replay Schedule: The meetings will be re-broadcast on cable television, channel 71 (Comcast) and channel 12 daily at 7:00 a.m., 1 p.m., and 8 p.m. Meetings are also able for replay online at [www.hyattsville.org/councilagendas](http://www.hyattsville.org/councilagendas).

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**1. Call to Order and Council Roll Call**

**2. Pledge of Allegiance to the Flag**

**3. Approval of Agenda**

**4. Approval of the Minutes**

**4.a) Approval of the Minutes**

**HCC-143-FY19**

I move that the Mayor and Council approve the Council Meeting Minutes for the Public Hearing of July 16, 2018 and the Regular Council Meeting of July 16, 2018.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Minutes Jul 16 2018 PH.pdf](#)

[Minutes Jul 16 2018 CM.pdf](#)

**5. Motion to Close (30 minutes)**

**5.a) Motion to Close (30 minutes)**

**HCC-152-FY19**

I move that the Council find that public discussion of security training and emergency plans that pertain to it would constitute a risk to the public or to public security.

The Council, having found that public discussion of security training and emergency plans that pertain to it would constitute a risk to the public or to public security, I further move that the Mayor and Council close the Council Meeting of November 19, 2018 in order to participate in security training and to discuss specifics of an emergency plan which pertains to the City Council.

This session will be closed under the authority of the Annotated Code of Maryland State Government General Provisions Article Section 3-305(b) (10) to discuss public security, including (i) the deployment of fire and police services and staff and (ii) the development and implementation of emergency plans.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

**6. Public Comment (8:10 p.m. – 8:20 p.m.) Limit 2 minutes per speaker**

**7. Presentations (8:20 p.m. - 8:30 p.m.)**

**7.a) Presentation of Proclamation in Honor of Councilmember Paula Perry (5 minutes)**

**HCC-142-FY19**

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

**7.b) FY17 Audit Update (5 minutes)**

**HCC-149-FY19**

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

**8. Consent Items (8:30 p.m. - 8:35 p.m.)**

**8.a) 2019 Council Regular & Budget Meeting Calendar**

**HCC-120-FY19**

I move that the Mayor and Council adopt the 2019 Council Meeting Schedule and the FY-2020 Budget Meeting Schedule, as presented.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[2019 Council Meeting Calendar Final.pdf](#)

**8.b) Re-Appointment to the Hyattsville Environment Committee**

**HCC-118-FY19**

I move that the Mayor and Council re-appoint Daniel Broder (Ward 2) to the Hyattsville Environment Committee for a term of 2 years to expire on November 19, 2020.

**Lead Sponsor:** Perry

**Co-Sponsor(s):** N/A

[Committee Application HEC Daniel Broder W2.pdf](#)

**8.c) Appointments to the Compensation Review Committee**

**HCC-145-FY19**

I move that the Mayor, with Council approval, appoint Desa Foster (Ward 1), Gregory Barnes (Ward 1), Kristina Alayan (Ward 2), Marialis Zmuda (Ward 2), Dean Thorp (Ward 3), Sarah Lawler (Ward 4), Cliff Mayo (Ward 5), and Chip Clarke (Ward 5) to the Compensation Review Committee.

**Lead Sponsor:** Hollingsworth

**Co-Sponsor(s):** N/A

[Committee Application CRC Desa Foster W1.pdf](#)

[Committee Application CRC Gregory Barnes W1.pdf](#)

[Committee Application CRC Kristina Alayan W2.pdf](#)

[Committee Application CRC Marialis Zmuda W2.pdf](#)

[Committee Application CRC Dean Thorp W3.pdf](#)

[Committee Application CRC Sarah Lawler W4.pdf](#)

[Committee Application CRC Cliff Mayo W5.pdf](#)

[Committee Application CRC Chip Clarke W5.pdf](#)

**8.d) DPW Facility New Construction Project - Purchase of Lifts  
HCC-33-FY19**

I move that the Mayor and Council authorize an expenditure not to exceed \$250,000 with Stertil-Koni, USA for the purchase of a Stertil-Koni Skylift Sky200 and a Stertil-Koni ECO 60-13 heavy equipment lifts, including installation and training, for the new DPW Facility.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[City of Hyattsville - new facility - 080118 \(003\).pdf](#)

[Stertil-Koni Contract 061015.pdf](#)

[Acceptance and Award-Stertil-Koni-061015.pdf](#)

**8.e) Proclamation in Recognition of Councilmember Paula J. Perry  
HCC-155-FY19**

I move that the Mayor and Council adopt a proclamation in recognition of Councilmember Paula J. Perry's dedicated service to the City of Hyattsville.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Proclamation Paula J. Perry \(3\).docx](#)

**8.f) Disbursement of Ward 3 Discretionary Funds  
HCC-157-FY19**

I move that the Mayor and Council approve the disbursement of Ward 3 Council Discretionary Funds as follows:

- a) \$100 for the Hyattsville Police Department's 15th Annual Shop with a Cop event.
- b) \$250 towards the purchase of Chromebooks for University Hills Elementary School

**Lead Sponsor:** Suiter

**Co-Sponsor(s):** Wright

**9. Action Items (8:35 p.m. - 9:15 p.m.)**

**9.a) Rhode Island Avenue Trolley Trail Extension (10 minutes)  
HCC-138-FY19**

I move that the City Council authorize the Mayor to submit correspondence on behalf of the City of Hyattsville to the Maryland Department of Transportation State Highway Administration relaying the following comments on the 30% Design Plans for the Rhode Island Avenue Trolley Trail extension:

- 1. Generally speaking, supportive of the project, including the road diet, and look forward to its completion;
- 2. The City supports SHA's design to eliminate the U-turn lane at 42nd Place;

3. The City supports SHA's design to extend the stacking capacity of Rhode Island Avenue at Crittenden Street;
4. The City is recommending a buffer between the bus loading/unloading area and the trail;
5. There are concerns that a 'No Left' turn for northbound vehicles at 43rd Place will have significant negative impact on motorists behavior and will create significant additional vehicle trips on adjacent City roadways. The City is conducting a traffic count at the intersection to determine the traffic count at this location. Prior to proceeding with a design that would include a 'No Left Turn' for northbound traffic at 43rd Place, SHA shall confirm the turning radius, width of the median area and provide the City with a way-finding signage plan.
6. SHA should remove the mid-block crosswalk currently located at the County Services Building and replace it with a crosswalk at the intersection of Rhode Island Avenue and 43rd Place;
7. The City has concerns regarding the lack of adequate line-of-sight for westbound vehicles on Charles Armentrout Drive approaching Rhode Island Avenue. The City requests that SHA perform a site assessment prior to introducing into the design a north crosswalk at the Charles Armentrout/Rhode Island Avenue intersection;
8. The City recommends that the next set of plans needs to incorporate an expanded queuing area for pedestrians/cyclists at the intersection of Rhode Island Avenue and Charles Armentrout Drive;
9. Crosswalks should be incorporated at intersections throughout the project site, they shall be well marked and signalized to the extent feasible by SHA. If a signal or beacon is not feasible, standalone crosswalks are to be striped, reflective and highly visible to motorists;
10. The City recommends the incorporation of overhead lighting into this segment of the trail.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Trolley Trail 30% Design Action Memo.docx](#)

[Planning Committee Minutes - 10.16.18.docx](#)

[Rhode Island Trolley Trail Presentation.pdf](#)

**9.b) Hyattsville Ordinance 2018-06, Repeal and Replace Chapter 8, Elections (10 minutes)**  
**HCC-150-FY19**

I move that the Mayor and Council introduce Hyattsville Ordinance 2018-06, an Ordinance whereby the City of Hyattsville repeals and replaces, in its entirety, Chapter 8 of the Hyattsville City Code to update, reorganize, and refine Chapter 8 to improve its overall clarity and better define the City's election policies and procedures. (FIRST READING).

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Chapter 8 Revisions 11.15.18.pdf](#)

**9.c) Hyattsville Ordinance 2018-07, Amendment to Chapter 10, Ethics (5 minutes)**  
**HCC-151-FY19**

I move that the Mayor and Council introduce Hyattsville Ordinance 2018-07, an Ordinance whereby the City of Hyattsville amends its ethics provisions to conform with contemporaneous changes to the City's Election laws. (FIRST READING).

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Chapter 10 Revisions 10.11.18.pdf](#)

**9.d) Adoption of Board of Supervisors of Elections Rules and Regulations (5 minutes)**

**HCC-153-FY19**

I move that the Mayor and Council adopt the Board of Supervisors of Elections Rules and Regulations.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[BOE Rules and Regulations 11.2.18.pdf](#)

**9.e) 3505 Hamilton Street Renovation Project - Architectural and Engineering Design Change Order (10 minutes)**

**HCC-114-FY19**

I move that the Mayor and Council authorize a change order not to exceed \$160,000 in the Johnson, Mirmiran, and Thompson (JMT) contract to cover additional redesign and engineering work at 3505 Hamilton Street and the amount is currently covered under contingency cost within the previously approved \$10,265,000 capital budget appropriations for this project.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[TO01A Change OrderProposal 1 Rev 3 08Oct2018.pdf](#)

**10. Discussion Items (9:15 p.m. - 9:45 p.m.)**

**10.a) Hyattsville Transportation Study (15 minutes)**

**HCC-146-FY19**

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Transportation Study Adoption Memo.docx](#)

[Hyattsville Comments on Final Report TDG Response.xlsx](#)

[Draft Final Report HVL Clean revised 092018.pdf](#)

[Appendix A: Hyattsville Transportation Study - Existing Conditions Memo](#)

[Appendix B: 2037 AM Build](#)

[Appendix B: 2037 AM No Build](#)

[Appendix B: 2037 PM Build](#)

[Appendix B: 2037 PM No Build](#)

[Appendix C: Wayfinding Submittal](#)

[Appendix D: Hyattsville TS Planning Level Cost Estimate](#)

[2018-09-26 Final Report Presentation to City Council.pdf](#)

[Transportation Study Council Meeting comments FINAL \(1\).docx](#)

**10.b) Chapter 8: Citywide Vote-By-Mail for 2021 Election (15 minutes)**

**HCC-132-FY19**

I move that the Mayor and Council authorize the City Attorney to draft revisions to Chapter 8 necessary to enable the Board of Elections Supervisors to distribute, proactively, a Vote-by-Mail ballot to all registered voters in the City of Hyattsville (on State and city-only registries). I further move that the Mayor and Council appropriate funds necessary to support this effort in the 2021 municipal election.

**Lead Sponsor:** Hollingsworth

**Co-Sponsor(s):** Lawrence, Suiter, Ward

**11. Council Dialogue**

**12. Community Notices and Meetings**

**12.a) City Calendar: November 20 - December 3, 2018**

**HCC-139-FY19**

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):**

[Main City Calendar Nov 20 - Dec 3 2018.docx](#)

**13. Motion to Adjourn**



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018  
Submitted by: Nicola Konigkramer  
Submitting Department: City Clerk  
Item Type: Legislative  
Agenda Section: Approval of the Minutes

### **SUBJECT**

Approval of the Minutes

### **HCC-143-FY19**

### **Recommendation:**

I move that the Mayor and Council approve the Council Meeting Minutes for the Public Hearing of July 16, 2018 and the Regular Council Meeting of July 16, 2018.

### **Sponsor(s):**

At the Request of the City Administrator

### **Co-Sponsor(s):**

N/A

### **ATTACHMENTS**

[Minutes\\_Jul 16 2018 PH.pdf](#)

[Minutes\\_Jul 16 2018 CM.pdf](#)

### **Summary Background:**

See attached.

### **Next Steps:**

Upon approval, final minutes will be posted on the City's website.

### **Fiscal Impact:**

N/A

### **City Administrator Comments:**

N/A

### **Community Engagement:**

N/A

### **Strategic Goals:**

Goal 1 - Ensure Transparent and Accessible Governance

### **Legal Review Required?**

N/A



## PUBLIC HEARING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

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Present: Candace Hollingsworth, Mayor  
Edouard Haba, W4 (Council President)  
Kevin Ward, W1 (Council Vice President)  
Bart Lawrence, W1  
Shani Warner, W2  
Carrianna Suiter, W3  
Thomas Wright, W3  
Paula Perry, W4  
Erica Spell, W5

Absent: Robert Croslin, W2  
Joseph A Solomon, W5

Also present were the following City staff members:

Tracey E. Nicholson, City Administrator  
Assistant City Administrator & Dir. of Community and Economic Development Jim Chandler  
Ron Brooks, City Treasurer  
Interim Police Chief Amal Awad  
Vivian Snellman, Director of Human Resources  
Laura Reams, City Clerk  
Nicola Konigkramer, Deputy City Clerk

### **Notice of Public Hearing**

The City of Hyattsville Mayor & Council will conduct a Public Hearing on Monday, July 16, 2018 at 7:30 p.m. (prior to the City Council Meeting). The purpose of the Public Hearing is to allow for residents to comment on the proposed Hyattsville Ordinance 2018-05, an Ordinance whereby the City of Hyattsville amends Chapter 114 to refine the City's residential parking permit system.

The Public Hearing will be held at the City Municipal Building, 4310 Gallatin Street, in the third floor Council Chambers. The Public Hearing will be broadcast live on Comcast Channel 71, Verizon Channel 12 and online at [www.hyattsville.org/meetings](http://www.hyattsville.org/meetings).

If you are unable to attend the hearing, comments may be directed to [cityclerk@hyattsville.org](mailto:cityclerk@hyattsville.org) or [speakuphvl.com/meetings](http://speakuphvl.com/meetings).

[Cover Page](#) 

[Ordinance 2018 Residential Parking \(Ch. 114\) 5-8-2018.pdf](#) 

[MM Re Ordinance 2018 Residential Parking \(Ch. 114\) 5-7-2018 Comments.pdf](#) 

### **1) Call to Order**

Mayor Hollingsworth called the Public Hearing to order at 7:32 p.m. and read the Notice of the Public Hearing.

### **2) Public Comment (7:30 p.m.)**

David Marshall, a Ward 2 resident, addressed the Mayor and Council regarding the revised Residential Parking Ordinance. Mr. Marshall noted concerns with the document but generally supported addressing





## PUBLIC HEARING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

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the parking issues within the City. Mr. Marshall cautioned Council against limiting the number of guest passes and suggested having an exception to the limit to ensure a fair distribution of parking spaces.

### 3) **Motion to Adjourn**

The Public Hearing adjourned at 7:36 p.m.



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

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Present: Candace Hollingsworth, Mayor  
Edouard Haba, W4 (Council President)  
Kevin Ward, W1 (Council Vice President)  
Bart Lawrence, W1  
Robert Croslin, W2  
Shani Warner, W2  
Carrianna Suiter, W3  
Thomas Wright, W3  
Paula Perry, W4  
Erica Spell, W5

Absent: Joseph A Solomon, W5

Also present were the following City staff members:

City Administrator Tracey E. Douglas  
Assistant City Administrator & Dir. of Community and Economic Development Jim Chandler  
City Treasurer Ron Brooks  
Interim Police Chief Amal Awad  
Director of Community Services Jake Rollow  
Director of Human Resources Vivian Snellman  
City Attorney E.I. Cornbrooks IV  
City Clerk Laura Reams  
Deputy City Clerk Nicola Konigkramer

### 1) **Call to Order and Council Roll Call**

Mayor Hollingsworth called the meeting to order at 8:04 p.m.

### 2) **Pledge of Allegiance to the Flag**

### 3) **Approval of Agenda**

Mayor Hollingsworth noted amendments to Motion #: HCC-38-FY19 Naming of 3505 Hamilton Street building in honor of retired Chief of Police, Douglas K. Holland and Motion #: HCC-29-FY19 Motion to Close.

|                  |                                                                                    |
|------------------|------------------------------------------------------------------------------------|
| <b>RESULT:</b>   | <b>APPROVED AS AMENDED [UNANIMOUS]</b>                                             |
| <b>MOVER:</b>    | Haba                                                                               |
| <b>SECONDER:</b> | Croslin                                                                            |
| <b>AYES:</b>     | Hollingsworth, Haba, Ward, Lawrence, Croslin, Warner, Suiter, Wright, Perry, Spell |
| <b>NAYS:</b>     | None                                                                               |
| <b>ABSENT:</b>   | Solomon                                                                            |

### 4) **Public Comment (8:10 p.m. – 8:20 p.m.) Limit 2 minutes per speaker**

Nick Harris, a Ward 2 resident, addressed the Mayor and Council in support of the proposed Magruder Pointe development, but in opposition to the proposed Mixed-Use Infill (M-U-I) zoning.

Daniel Muth, a Ward 1 resident, addressed the Mayor and Council in opposition to the proposed Magruder Pointe development and the proposed rezoning.



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Jonathan Muller, Todd Dengel, and Chad Copeland addressed the Mayor and Council on behalf of the Hyattsville Planning Committee. The members stressed the importance of the Committee's recommendations on proposed developments in the City.

Brendan Cain, a Ward 2 resident, addressed the Mayor and Council in support of the proposed Magruder Pointe development, but in opposition to the proposed M-U-I zoning. Mr. Cain also expressed concerns for the proposed Armory Apartments project and related traffic issues.

Chris Colaw, a Ward 2 resident, addressed the Mayor and Council in support of the proposed Magruder Pointe development, but in opposition to the proposed M-U-I zoning.

Austin Lipari, a Ward 1 resident, addressed the Mayor and Council in support of the proposed Magruder Pointe and Armory Apartments developments. Mr. Lipari noted exterior architecture preferences for the Armory Apartments development.

Will Seath, a Ward 2 resident, addressed the Mayor and Council in support of the proposed Magruder Pointe development and rezoning to M-U-I. Mr. Seath also noted concerns for the quality of architecture for the proposed Armory Apartments development.

Jen Hanna, a Ward 2 resident, addressed the Mayor and Council in opposition to the proposed Magruder Pointe development and rezoning to M-U-I.

Paul Hrusa, a Ward 2 resident, addressed the Mayor and Council in opposition to the proposed Magruder Pointe development and rezoning to M-U-I.

Rosanna Weaver, a Ward 1 resident, addressed the Mayor and Council in support of renewing the Hyattsville Life and Times Contract. Ms. Weaver spoke to her work as an editor and board member of the paper and the mutual partnership the paper had with the City.

Brian Minter, a Ward 2 resident, addressed the Mayor and Council in opposition to the proposed Magruder Pointe development and rezoning to M-U-I.

Stefano Terricola, a Ward 2 resident, addressed the Mayor and Council in support of the proposed Magruder Pointe development, but in opposition to the proposed M-U-I zoning. Mr. Terricola commended the efforts of the Planning Committee and urged Council to consider their review of the development.

Jennifer Bosworth, a Ward 2 resident, addressed the Mayor and Council in opposition to the proposed Magruder Pointe development and rezoning to M-U-I. Ms. Bosworth noted the importance of keeping Magruder Park an open green space.

Greg Smith, a Ward 1 resident, addressed the Mayor and Council in opposition to the proposed Magruder Pointe development and rezoning to M-U-I.

Patrick Riordon, a Ward 1 resident, addressed the Mayor and Council in support of the proposed Magruder Pointe and Armory Apartments developments.

Maureen Vosmek, a Ward 2 resident, addressed the Mayor and Council in opposition to the proposed Magruder Pointe development and rezoning to M-U-I.

David Marshall, a Ward 2 resident, addressed the Mayor and Council in support of the proposed Magruder Pointe development. Mr. Marshall recognized Police Chief Douglas Holland and Sergeant Suzie Johnson and



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

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wished them well in their retirements. Mr. Marshall further thanked Mayor Hollingsworth for her service and campaigning for Prince George's County Council.

### 5) **Presentations (8:20 p.m. - 8:50 p.m.)**

#### **5.a Presentation of Proclamations in Honor of Retiring Police Chief Douglas K. Holland and Sgt. Suzette Johnson (10 minutes)**

**HCC-24-FY19**

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City Administrator Nicholson introduced the presentation in honor of retiring Police Chief Douglas K. Holland and Sergeant Suzette Johnson. Interim Police Chief Amal Awad read the proclamations in honor of Chief Holland and Sergeant Johnson. Mayor Hollingsworth presented the retirees with the proclamations and City flags.

#### **5.b FY-2017 Audit Update (5 minutes)**

**HCC-35-FY19**

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Treasurer Brooks provided an update for the FY16 and FY17 Audits. Treasurer Brooks reported that the City had not yet filed the FY16 Audit due to incorrectly placed categories. Treasurer Brooks stated that the auditors were taking a closer look at the FY16 Audit and that it would be closed in the following weeks. Treasurer Brooks added that the FY17 Audit had begun.

Councilmember Wright offered accolades to Treasurer Brooks for his work to bring the Audits up to date. Councilmember Wright asked if there were any consequences for the delays in completing the FY16 Audit. Treasurer Brooks confirmed that the State had the ability to withhold grant funding but noted that the City provided periodic updates and maintained an open dialogue. Councilmember Wright asked for clarification on completion timelines and Treasurer Brooks stated the FY17 Audit would have a late filing toward the end of the calendar year, while the FY18 Audit was on-time.

#### **5.c Hyattsville Armory Apartments: Detailed Site Plan and Preliminary Plan of Subdivision (15 minutes)**

**HCC-8-FY19**

[Cover Page](#) 

[Presentation\\_to\\_City\\_Council\\_180716 \(2\).pptx](#) 

Assistant Administrator Chandler provided a brief summary of the proposed project and introduced Brook Katzen, Senior Vice President of Development for Urban Investment Partners (UIP). Assistant Administrator Chandler noted that UIP would present the proposal at the next meeting of the Planning Committee.

Mr. Katzen provided background information on UIP and a general overview of the project. Mr. Katzen stated the proposal was for a mixed-use development with 32,000 squared feet of retail and 284 apartments. Mr. Katzen noted the expansion of the sidewalks, in front of the property, from four (4) feet to approximately 20 feet. Mr. Katzen reviewed the site traffic circulation plan, highlighting three (3) entry points. Mr. Katzen provided details for the preliminary plan of subdivision, which included seven (7) different parcels that connected into a single project. Mr. Katzen noted school impact fees of approximately \$2 million and a \$700,000 public safety surcharge. Mr. Katzen provided the project timeline, with a start date of February 2019 and a completion date of August 2021.

Councilmember Warner noted the impact of the development on schools, infrastructure, traffic, and parking. Councilmember Warner asked for clarification on the proposed flow of traffic for Hamilton Street



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and Alternate Route One. Mr. Katzen stated that improvements to the intersection were being discussed at the State level. Assistant Administrator Chandler added that the Maryland State Highway Administration (SHA) was considering converting the intersection from a ramp to a right turn. Mr. Katzen confirmed that there would be enough width to create dedicated turn lanes into the project property as well as a potential municipal parking garage.

Councilmember Spell expressed appreciation for the consideration of Crossover Church. Councilmember Spell highlighted resident concern regarding the architecture and asked if Mr. Katzen could speak to the design process. Mr. Katzen introduced Jonathan Johnson, architect for the project. Mr. Johnson stated that the design took a large building and broke it down into different themed components. Mr. Katzen added that adjustments could be made based on resident and Council feedback.

Council Vice President Ward asked for projections of demographics that would affect the local schools. Mr. Katzen presented estimates of 38 new elementary school students, 15 middle school students, and 21 high school students.

Council President Haba asked for building details and Mr. Katzen stated the proposal was mostly six (6) stories, with one (1) level of retail and five (5) levels of apartment units. Mr. Katzen added that there were portions of the building that were shorter, approximately 75 feet tall.

Councilmember Wright said that he looked forward to hearing the Planning Committee review and recommendations. Councilmember Wright further offered accolades to the Committee and invited residents to attend the upcoming meeting.

### 6) **Consent Items (8:50 p.m. - 8:55 p.m.)**

#### **6.a Proclamation Recognizing Douglas K. Holland for His Years of Service to the City of Hyattsville HCC-22-FY19**

I move that the Mayor and Council recognize the honorable and distinguished career of the City of Hyattsville's Chief of Police, Colonel Douglas K. Holland, who after more than 44 years of police service, is entering a well-deserved retirement.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#) 

[Proclamation\\_for\\_Chief\\_Holland.docx](#) 

#### **6.b Naming of 3505 Hamilton Street building in honor of retired Chief of Police, Douglas K. Holland HCC-38-FY19**

I move that the Mayor and Council dedicate a public space within the new police facility located 3505 Hamilton Street in honor of retired Chief of Police Douglas K. Holland.

**Lead Sponsor:** Spell

**Co-Sponsor(s):** Croslin, Warner, Suiter, Wright, Haba, Perry and Solomon

[Cover Page](#) 

#### **6.c Proclamation Recognizing Suzette Johnson for Her Years of Service to the City of Hyattsville HCC-26-FY19**

I move that the Mayor and Council recognize Sergeant Suzette Johnson for 25 years of dedicated service to the City of Hyattsville, as she prepares to enter a well-deserved retirement.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#) 



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

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[Proclamation\\_for\\_Sgt.\\_Suzie\\_Johnson \(1\).docx](#)

### **6.d Maryland SHA Lighting System Agreement - 3401 East-West Highway**

#### **HCC-1-FY19**

I move the City Council authorize the Mayor and City Administrator to execute a Memorandum of Understanding with Maryland State Highway Administration for the purpose of the City accepting ownership of the pedestrian lighting at 3401 East-West Highway, Hyattsville and amendment to the MOU between the City of Hyattsville and Kiplinger Editors Press to incorporate the SHA lighting agreement as an Exhibit document.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[Memo - Kiplinger SHA Lighting Agreement.docx](#)

[MOU Hyattsville lighting agreement.docx](#)

[Kiplinger - Lighting Plan.pdf](#)

### **6.e FY19 CED Vehicle Acquisition**

#### **HCC-2-FY19**

I move the City Council authorize the City Administrator to execute purchase orders with Criswell Nissan of Germantown, Inc., 19574 Amaranth Drive, Germantown, Maryland 20854, for the acquisition of the the following vehicle to support on-going operations for the Department of Community & Economic Development:

\$22,321.00 - Purchase of one (1) Nissan NV200 Compact Cargo Van - State of Maryland Contract Number: 001B8400179

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[Memo - FY2019 Vehicle Acquisition.docx](#)

[Maryland Purchase Agreement - Vehicles - 2018.PDF](#)

### **6.f DSP-17044: Riverfront at West Hyattsville Architecture Plan**

#### **HCC-6-FY19**

I move that the City Council authorize the Mayor send correspondence to the Maryland-National Capital Park & Planning Commission regarding DSP-17004, Riverfront at West Hyattsville Metro, stating the City of Hyattsville's support of the detailed site plan application, subject to the following conditions:

1. The applicant shall revise the side elevations of townhouse units facing prominent locations and areas scheduled to be dedicated as public rights-of-way with building materials and textures consistent with the front facing exterior townhouse facades;
2. The applicant shall consider revising the rear exterior façade elevations to provide a variety of materials, textures or colors.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[DSP-17044 Action Memo.docx](#)

[Architecture Plan DSP-17044](#)

[DSP-17044 Landscape Plan](#)

[DSP-17044 Statement of Justification](#)

[Planning Committee Minutes - 05.15.18.docx](#)

### **6.g Zoning Variance Request V-42-18: 5815 36th Avenue**

#### **HCC-3-FY19**



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

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I move the City Council authorize the City Administrator to issue correspondence to the Prince George's County Board of Zoning Appeals stating the City of Hyattsville's support of V-42-18, a zoning variance application for the subject property at 5815 36th Avenue, Hyattsville to permit a variance of 19.3% total lot coverage and a waiver of the parking area location requirement.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#) 

[V-42-18\\_Memo.docx](#) 

[V-42-18 Plat.pdf](#) 

### **6.h Zoning Variance Request V-40-18: 5833 36th Avenue**

**HCC-4-FY19**

I move the City Council authorize the City Administrator to issue correspondence to the Prince George's County Board of Zoning Appeals stating the City of Hyattsville's support of V-40-18, a zoning variance application for the subject property at 5833 36th Avenue, Hyattsville to permit a variance of 8.5% total lot coverage, four (4) feet front yard depth and a waiver of the parking area location requirement.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#) 

[V-40-18\\_Memo.docx](#) 

[V-40-18 Plat.pdf](#) 

### **6.i IT Switch Refresh Project**

**HCC-10-FY19**

I move the City Council authorize the City Administrator to execute a Purchase Agreement with Dataprise Inc., 3700 Koppers Street, Suite 520, Baltimore, Maryland 21227, to provide for IT hardware and integration services, in an amount not to exceed \$16,500.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#) 

[Memo - IT Switch Refresh Project.docx](#) 

### **6.j Re-appointment to Code Compliance Advisory Committee**

**HCC-12-FY19**

I move that the Mayor and Council re-appoint Edward Bohls (Ward 2) to the Code Compliance Advisory Committee for a term of 2 years, ending on July 16, 2020.

**Lead Sponsor:** Warner

**Co-Sponsor(s):** N/A

[Cover Page](#) 

[Committee Application\\_Code\\_Bohls W2.pdf](#) 

### **6.k Re-Appointment to Police and Public Safety Citizens' Advisory Committee**

**HCC-13-FY19**

I move that the Mayor and Council re-appoint Jennifer Bangoura (Ward 2) to the Police and Public Safety Citizens' Advisory Committee for a term of 2 years, ending on July 16, 2020.

**Lead Sponsor:** Warner

**Co-Sponsor(s):** Spell

[Cover Page](#) 

[Committee Application\\_PPSAC\\_Bangoura W2.pdf](#) 

### **6.l Appointments to Race and Equity Task Force**



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

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### **HCC-14-FY19**

I move that the Mayor and Council appoint Shannon Wyss (Ward 4), Joanne Waszczak (Ward 1), Deyo Johnson (Ward 2), Chuck Perry (Ward 3), Jessica Arends (Ward 1), Cindy Zork (Ward 3), and Ife Floyd (Ward 2) to the Ad Hoc Race and Equity Task Force for a term to expire 120 days after the first meeting of the committee.

**Lead Sponsor:** Hollingsworth

**Co-Sponsor(s):** N/A

[Cover Page](#)

[Committee Application\\_RETf\\_Perry W3.pdf](#)

[Committee Application\\_RETf\\_Waszczak W1.pdf](#)

[Committee Application\\_RETf\\_Wyss W4.pdf](#)

[Committee Application\\_RETf\\_Zork W3.pdf](#)

[Committee Application\\_RETf\\_Arends W1.pdf](#)

[Committee Application\\_RETf\\_Floyd W2.pdf](#)

[Committee Application\\_RETf\\_Johnson W2.pdf](#)

### **6.m FY19 Renewal of Adirondack Tree Experts Contract**

#### **HCC-17-FY19**

I move that the Mayor and Council authorize the City Administrator to renew the City's contract with Adirondack Tree Experts for FY19 tree work in the City in an amount not to exceed \$150,000. This contract has been reviewed and approved by the City Attorney for legal sufficiency.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

### **6.n FY19 DPW Vehicle Purchase - Administration Vehicle**

#### **HCC-19-FY19**

I move that the Mayor and Council authorize the expenditure of FY19 Capital Improvement Funds in an amount not to exceed \$34,000.00 for the purpose of purchasing a Ford Explorer Utility Vehicle from Heritage Fleet Services, utilizing the Anne Arundel County Blanket Contract 5274-OB rider.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[Memo\\_-\\_DPW\\_Vehicle\\_and\\_Equipment\\_Purchases\\_2018\\_LR.docx](#)

[Admin car 2018.pdf](#)

[Anne Arundel blanket award & renewal letter - Ford 18.pdf](#)

[Anne Arundel County IFBno 16-131.pdf](#)

### **6.o FY19 Grant Acceptance: GOCCP New/Replacement Body Armor**

#### **HCC-21-FY19**

I move that the Mayor and Council accept and appropriate into the FY19 budget a matching grant from the Governor's Office of Crime Control & Prevention in the amount of \$8,780 for the purchase of new and replacement body armor.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[GOCCP New Replacement Body Armor Grant.pdf](#)

### **6.p Annual Service Agreement with Motorola for Radio Communications Dispatch System and Portable and Mobile Radios**





## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

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### **HCC-23-FY19**

I move that the Mayor and Council authorize the expenditure of \$30,383.75 for the renewal of the Annual Motorola Service Agreement for maintenance on our Dispatch Console, Portable and Mobile radios.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[Service Agreement Memo 7 2 2018 FINAL.docx](#)

### **6.q FY19 Grant Acceptance: SMADC Grant for Farmers Market**

#### **HCC-27-FY19**

I move that the Mayor and Council accept and appropriate into the FY19 budget a grant for \$1,000 from the Southern Maryland Agricultural Development Commission to assist in marketing efforts of the Hyattsville Farmers Market in 2019.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

### **6.r Hyattsville Life and Times Contract**

#### **HCC-28-FY19**

I move that the Mayor and Council authorize the City Administrator to contract with the Hyattsville Life and Times to purchase advertising for FY19 at a cost not to exceed \$28,680.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

### **6.s Proclamation in Recognition of the Maryland Buy Local Challenge**

#### **HCC-30-FY19**

I move that the Mayor and Council recognize the last full week in July 2018 as the Maryland Buy Local Challenge, which encourages Marylanders to eat at least one (1) thing from a local farm each day from July 21 to July 29, 2018.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[2018 Maryland Buy Local Challenge.docx](#)

### **6.t Mentor Network Contract**

#### **HCC-31-FY19**

I move that the Mayor and Council authorize the City Administrator to negotiate a contract with Northstar Tutoring for the provision of tutoring and mentorship services for Hyattsville teenagers at a cost not to exceed \$50,000, upon the review and approval of the City Attorney for legal sufficiency.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[Firm Selection Memo\\_Mentorship.docx](#)

### **6.u Disbursement of Ward 3 Discretionary Funds for FY18**

#### **HCC-39-FY19**

I move that the Mayor and Council approve the disbursement of \$300 from the Ward 3 FY18 Council Discretionary Funds for the Teen Club. This expenditure was approved by the Executive Committee prior to the close of the fiscal year.

**Lead Sponsor:** Wright



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

**Co-Sponsor(s):** Suiter

[Cover Page](#)

### **6.v Hyattsville CDC: Request for Maryland DHCD Letter of Support HCC-40-FY19**

I move that the Mayor and Council authorize the City Administrator to provide a letter of support to the Hyattsville Community Development Corporation for its State of Maryland Department of Housing and Community Development (DHCD)'s Operating Assistance Grant. The grant is intended to support the creation of a new market analysis for Hyattsville and for the Route 1 Corridor.

**Lead Sponsor:** Executive Committee

**Co-Sponsor(s):** N/A

[Cover Page](#)

[HCDC LOS Grant App\\_Market Analysis.docx](#)

|                  |                                                                                    |
|------------------|------------------------------------------------------------------------------------|
| <b>RESULT:</b>   | <b>APPROVED AS AMENDED [UNANIMOUS]</b>                                             |
| <b>MOVER:</b>    | Haba                                                                               |
| <b>SECONDER:</b> | Lawrence                                                                           |
| <b>AYES:</b>     | Hollingsworth, Haba, Ward, Lawrence, Croslin, Warner, Suiter, Wright, Perry, Spell |
| <b>NAYS:</b>     | None                                                                               |
| <b>ABSENT:</b>   | Solomon                                                                            |

## **7) Motion to Close (8:55 p.m. - 9:25 p.m.)**

### **7.a Motion to Close (30 minutes)**

#### **HCC-29-FY19**

I move that the Mayor and Council close the Council Meeting of July 16, 2018, to discuss confidential commercial or financial information related to a proposed development and to obtain legal advice.

The reason for closing the meeting under this exception is to maintain legally required confidentiality in regard to commercial and/or financial information. The meeting will also be closed so that the Mayor and Council may receive legal advice. The reason for closing the meeting under this exception is to protect attorney-client communications.

This session will be closed under the authority of the Annotated Code of Maryland State Government General Provisions Article Section 3-305(b) (13) To comply with a specific constitutional, statutory, or judicially imposed requirement that prevents public disclosures about a particular proceeding or matter; and 3-305(b) (7) to consult with counsel to obtain legal advice.

**Lead Sponsor:** Hollingsworth

**Co-Sponsor(s):** N/A

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Pursuant to the requirement of the Annotated Code of Maryland State Government Article 3-306(C)(2); this statement is included in these minutes:

A closed session of the Council of the City of Hyattsville was held at 9:27 p.m. on Monday, July 16, 2018, in the City of Hyattsville Municipal Building, Third Floor Council Chambers.

In addition to the City Council, the following staff members were present: **City Administrator Tracey E. Nicholson, Assistant City Administrator Jim Chandler, City Treasurer Ron Brooks, City Clerk Laura Reams, and Abigail Ferretti, Founding Principal for Partners for Economic Solutions.**



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

**Council Member Solomon was absent.**

This session will be closed under the authority of the Annotated Code of Maryland State Government General Provisions Article Section 3-305(b) (13) To comply with a specific constitutional, statutory, or judicially imposed requirement that prevents public disclosures about a particular proceeding or matter; and 3-305(b) (7) to consult with counsel to obtain legal advice.

Topics Discussed: Riverfront at West Hyattsville Revitalization Tax Credit Application and Analysis.

Action Taken: N/A

Council Vice President Ward made a motion to adjourn the closed session, which was seconded by Council President Haba and approved unanimously by the Council. The closed session adjourned at 10:06 p.m.

|                  |                                                                             |
|------------------|-----------------------------------------------------------------------------|
| <b>RESULT:</b>   | <b>APPROVED AS AMENDED [UNANIMOUS]</b>                                      |
| <b>MOVER:</b>    | Haba                                                                        |
| <b>SECONDER:</b> | Croslin                                                                     |
| <b>AYES:</b>     | Hollingsworth, Haba, Ward, Lawrence, Croslin, Warner, Suiter, Wright, Spell |
| <b>NAYS:</b>     | Perry                                                                       |
| <b>ABSENT:</b>   | Solomon                                                                     |

### 8) Action Items (9:25 p.m - 10:15 p.m.)

#### 8.a Hyattsville Ordinance 2018-02: State Mandated Changes to Ethics Code (5 minutes)

HCC-25-FY19

I move that the Mayor and Council introduce Hyattsville Ordinance 2018-02, an Ordinance whereby the City of Hyattsville amends its ethics provisions to conform to recent updates to State law as to financial reporting and conflicts of interest (FIRST READING).

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#) 

[Ordinance 2018-02 Ethics\\_FINAL.docx](#) 

[2018 Ethics changes.pdf](#) 

Council President Haba referenced language in Section B (5), page 1, line 23, and asked for clarity on the intent of the paragraph. City Attorney Cornbrooks stated that it was a prohibition on the former regulated lobbyists participating in any other named capacity. Council President Haba asked for consistency in language referring to elected or appointed officials. City Attorney Cornbrooks explained that there was little room to make edits to State mandated changes. City Attorney Cornbrooks added that he would take a closer look at specific language.

|                  |                                                                                    |
|------------------|------------------------------------------------------------------------------------|
| <b>RESULT:</b>   | <b>APPROVED [UNANIMOUS]</b>                                                        |
| <b>MOVER:</b>    | Haba                                                                               |
| <b>SECONDER:</b> | Perry                                                                              |
| <b>AYES:</b>     | Hollingsworth, Haba, Ward, Lawrence, Croslin, Warner, Suiter, Wright, Perry, Spell |
| <b>NAYS:</b>     | None                                                                               |
| <b>ABSENT:</b>   | Solomon                                                                            |

#### 8.b CSP-18002: Magruder Pointe (Revised as of June 29) (20 minutes)

HCC-11-FY19

**Lead Sponsor:** At the Request of the City Administrator



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

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**Co-Sponsor(s):** N/A

[Cover Page](#)

[Magruder Pointe Amended\\_CSP\\_Memo\\_July\\_10.docx](#)

[6.27.18.SOI MUI CSP.pdf](#)

[Dwelling Units per Acre\\_06192018 \(2\).pdf](#)

[Planning Committee Minutes - 03.20.2018.pdf](#)

[Planning Committee Minutes - 06.19.18.docx](#)

Assistant Administrator Chandler summarized the revised proposal for the Magruder Pointe Development. He stated that staff did not recommend supporting a zoning of Mixed-Use Infill (M-U-I). Assistant Administrator Chandler added that an R-55 zoning would potentially be introduced as an alternative in the Planning Board hearing scheduled for July 26, 2018. He also noted that the City had recorded public comments regarding the table of use, which would no longer be relevant in conversations with the Planning Board, as the application had changed. Assistant Administrator Chandler suggested that Council update comments to address the potential R-55 zoning.

Council President Haba highlighted mixed resident opinions regarding the M-U-I and R-55 zoning. Assistant Administrator Chandler clarified that M-U-I was a broad zoning category that staff did not find appropriate for the property. Council President Haba asked if the R-55 zoning would reduce the density and Assistant Administrator Chandler stated that density would be reduced slightly from the recommended 7.7 units but would be dependent on the detailed site plan.

Councilmember Wright asked for clarity on how the R-55 zoning was relevant if the M-U-I zoning was being discussed by the Planning Board. Assistant Administrator Chandler noted conversations with the reviewer and said that R-55 zoning could be included as a condition on the project. Councilmember Wright asked if the process was legally sound and Assistant Administrator Chandler stated that the Planning Board was under the impression that they could make the R-55 recommendation to the District Council. Planner Gerbes added that the R-55 zoning was the Planning staff's recommendation and that the Planning Board could accept or reject the recommendation.

Councilmember Croslin asked for further explanation of the R-55 zoning, if it would limit the developer to building only single-family homes. Assistant Administrator Chandler clarified that he was unsure because the applicant would need to return with a new subdivision application. Planner Gerbes added that the plan would most likely see a reduction in the number of units.

Councilmember Lawrence asked how staff became aware of the potential for the R-55 recommendation to be approved. Planner Gerbes said that staff could be considering the R-55 zoning in place of the unpopular M-U-I zoning recommendation.

Councilmember Warner said that her decision was easy because she had heard a large opposition to the M-U-I proposal from residents. Councilmember Warner added that she preferred the fourth option for motion language because it prioritized open space zoning. Council President Haba expressed support for the motion language that recommended the R-55 zoning. Councilmember Lawrence stated that his position had not changed and that he would also support the fourth option.

Council President Haba moved the third option for motion language. Councilmember Wright expressed concerns for supporting the R-55 zoning because it was not included in the application and that he would lean toward supporting the fourth option. Councilmember Warner added that she would move the fourth option for motion language if the motion at hand failed.

**HCC-11-FY19**



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

I move that the City Council authorize the Mayor to send correspondence to the Maryland-National Capital Park and Planning Commission to state the body's decision not to support the conceptual site plan application for Magruder Pointe (CSP-18002), which calls for the rezoning of the lower parcel of the subject application to M-U-I. The City Council would, however, support a rezoning of the lower lot to R-55.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

|                  |                                                 |
|------------------|-------------------------------------------------|
| <b>RESULT:</b>   | <b>FAILED [5-5]</b>                             |
| <b>MOVER:</b>    | Haba                                            |
| <b>SECONDER:</b> | Perry                                           |
| <b>AYES:</b>     | Haba, Ward, Croslin, Perry, Spell               |
| <b>NAYS:</b>     | Hollingsworth, Lawrence, Warner, Suiter, Wright |
| <b>ABSENT:</b>   | Solomon                                         |

### HCC-11-FY19

I move that the City Council authorize the Mayor to send correspondence to the Maryland-National Capital Park and Planning Commission to state the body's decision not to support the conceptual site plan application for Magruder Pointe (CSP-18002), which calls for the rezoning of the lower parcel of the subject application to M-U-I. We continue to support the existing zoning of open space on the lower lot.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

Councilmember Wright further expressed concerns for using language regarding the R-55 zoning. Councilmember Lawrence said that he did not believe an R-55 zoning would have a remarkable change. Councilmember Wright clarified that he would like to see the motion language state support for the current open space zoning of the lower lot. Council President Haba suggested amending one of the motion options to state support of the current zoning. The motion was amended on a motion made by Councilmember Wright and seconded by Councilmember Lawrence and passed by the body with a 6-4 vote.

|                  |                                                 |
|------------------|-------------------------------------------------|
| <b>RESULT:</b>   | <b>FAILED AS AMENDED [5-5]</b>                  |
| <b>MOVER:</b>    | Warner                                          |
| <b>SECONDER:</b> | Lawrence                                        |
| <b>AYES:</b>     | Hollingsworth, Lawrence, Warner, Suiter, Wright |
| <b>NAYS:</b>     | Haba, Ward, Croslin, Perry, Spell               |
| <b>ABSENT:</b>   | Solomon                                         |

### HCC-11-FY19

I move that the City Council authorize the Mayor to send correspondence to the Maryland-National Capital Park and Planning Commission to state the body's decision not to support the conceptual site plan application for Magruder Pointe (CSP-18002), which calls for the rezoning of the lower parcel of the subject application to M-U-I.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

There was no further discussion.

|                  |                                                                             |
|------------------|-----------------------------------------------------------------------------|
| <b>RESULT:</b>   | <b>APPROVED [9-1]</b>                                                       |
| <b>MOVER:</b>    | Warner                                                                      |
| <b>SECONDER:</b> | Haba                                                                        |
| <b>AYES:</b>     | Hollingsworth, Haba, Ward, Lawrence, Croslin, Warner, Suiter, Wright, Spell |
| <b>NAYS:</b>     | Perry                                                                       |



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

|                |         |
|----------------|---------|
| <b>ABSENT:</b> | Solomon |
|----------------|---------|

### 8.c DSP-18003: Landy Property (Infrastructure Only) (15 minutes)

#### HCC-5-FY19

I move that the City Council authorize the Mayor to submit correspondence on behalf of the City of Hyattsville to the Maryland-National Capital Park & Planning Commission in support the preliminary plan of subdivision for the Landy development DSP-18003, subject to the following conditions:

1. The applicant shall revise the proposed 'sub-urban' subdivision concept for the entry signage and replace it with an illuminated art/signage installation;
2. The applicant shall modify the landscaping plan to eliminate, or significantly reduce the quantity of *Acer rubrum* and *liriope muscari*;
3. In lieu of a proposed 'security call box', the applicant shall include on its site plan the location of an elevated security camera, as specified by the Hyattsville Police Department at the entrance along Belcrest Road, which shall be networked into the City's existing camera network at a cost not to exceed \$16,000;
4. Staff recommends the dedication of the proposed park area in the northwest section of the development to the City of Hyattsville for public use;
5. The applicant shall install two (2) sets of Big Belly trash and recycling compactors within the park;
6. The City acknowledges that conditions 3 - 5 shall require a separate agreement between the Applicant/Owner and the City of Hyattsville.

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[Infrastructure\\_DSP\\_Action\\_Memo\\_FINAL](#)

[DSP Infrastructure.pdf](#)

[Landscape and Lighting Plan.pdf](#)

[Tree Conservation Plan.pdf](#)

[Planning Committee Minutes - 05.15.18.docx](#)

Assistant Administrator Chandler introduced the Landy Property detailed site plan for infrastructure and provided a brief timeline of the project. Assistant Administrator Chandler highlighted new staff recommendations, which included dedicating the proposed park area for public use. Assistant Administrator Chandler reviewed the annexation process that would allow for the property to seamlessly transition into the City.

Councilmember Croslin asked why staff recommended a reduction in trees and Assistant Administrator clarified that it was a specific item from the Department of Public Works Director, Lesley Riddle. Planner Gerbes added that the species listed tended to attract rodents. Councilmember Wright confirmed that the motion included the Planning Committee's recommendations.

|                  |                                                                                    |
|------------------|------------------------------------------------------------------------------------|
| <b>RESULT:</b>   | <b>APPROVED [UNANIMOUS]</b>                                                        |
| <b>MOVER:</b>    | Haba                                                                               |
| <b>SECONDER:</b> | Perry                                                                              |
| <b>AYES:</b>     | Hollingsworth, Haba, Ward, Lawrence, Croslin, Warner, Suiter, Wright, Perry, Spell |
| <b>NAYS:</b>     | None                                                                               |
| <b>ABSENT:</b>   | Solomon                                                                            |

### 8.d DSP-03012-04: Aldi Expansion Project (10 minutes)

#### HCC-7-FY19

I move that the City Council authorize the Mayor to submit correspondence on behalf of the City of Hyattsville to the Maryland-National Capital Park & Planning Commission in support the preliminary plan



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

of subdivision for the Aldi expansion project, DSP-03012-04, subject to a revision of the landscaping plan to replace the following species with species native to the region:

- o Fraxinus pensylvanica 'summit' (summit green ash)
- o Taxus x media 'densiformis' (densiformis yew)
- o Euyonymus alatus 'compactus' (dwarf winged euyonymus)

The City Council also recommends that a mural is added to the blank wall to keep with the spirit of the Arts District. The Council supports the installation of bicycle

**Lead Sponsor:** At the Request of the City Administrator

**Co-Sponsor(s):** N/A

[Cover Page](#)

[Aldi DSP-03012-04\\_Action\\_Memo\\_FINAL.docx](#)

[\\_Statement of Justification.pdf](#)

[DSP - Aldi Hyattsville.pdf](#)

[ILLUSTRATIVE PLAN.pdf](#)

[25 A201 - Exterior Elevations.pdf](#)

[Planning Committee Minutes - 06.19.18.docx](#)

Planner Gerbes introduced the 3,100-foot expansion of the Aldi located on Hamilton Street in Ward 5. Planner Gerbes clarified that the expansion would cut into the existing parking lot, reducing the parking spaces from 84 to 75. Planner Gerbes added that the store would close for five to six (5-6) weeks during the renovation. Planner Gerbes noted a proposed rain garden to help alleviate storm water runoff. She also stated that there were proposed replacements for removal of nonnative species from the property. Planner Gerbes then highlighted variance requests that staff supported.

Councilmember Lawrence noted comments from the Planning Committee and asked why they had not been included in the motion language. Planner Gerbes stated that recommendations of installation of bike racks and a mural could be included in the motion language. The motion was amended on a motion made by Councilmember Lawrence and seconded by Councilmember Warner and passed by the body unanimously.

|                  |                                                                                    |
|------------------|------------------------------------------------------------------------------------|
| <b>RESULT:</b>   | <b>APPROVED AS AMENDED [UNANIMOUS]</b>                                             |
| <b>MOVER:</b>    | Haba                                                                               |
| <b>SECONDER:</b> | Perry                                                                              |
| <b>AYES:</b>     | Hollingsworth, Haba, Ward, Lawrence, Croslin, Warner, Suiter, Wright, Perry, Spell |
| <b>NAYS:</b>     | None                                                                               |
| <b>ABSENT:</b>   | Solomon                                                                            |

### 9) Council Dialogue

### 10) Community Notices and Meetings

**10.a City Calendar: July 17 - August 6, 2018**

**HCC-16-FY19**

[Cover Page](#)

[Main City Calendar\\_Jul 17 - Aug 6 2018.docx](#)

### 11) Motion to Adjourn

|                  |                                                                                    |
|------------------|------------------------------------------------------------------------------------|
| <b>RESULT:</b>   | <b>APPROVED [UNANIMOUS]</b>                                                        |
| <b>MOVER:</b>    | Croslin                                                                            |
| <b>SECONDER:</b> | Perry                                                                              |
| <b>AYES:</b>     | Hollingsworth, Haba, Ward, Lawrence, Croslin, Warner, Suiter, Wright, Perry, Spell |



## REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD JULY 16, 2018

---

|                |         |
|----------------|---------|
| <b>NAYS:</b>   | None    |
| <b>ABSENT:</b> | Solomon |

The meeting adjourned at 11:19 p.m.





## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Laura Reams

Submitting Department: Community & Economic Development

Item Type: Legislative

Agenda Section: Motion to Close (30 minutes)

### **SUBJECT**

Motion to Close (30 minutes)

### **HCC-152-FY19**

#### **Recommendation:**

I move that the Council find that public discussion of security training and emergency plans that pertain to it would constitute a risk to the public or to public security.

The Council, having found that public discussion of security training and emergency plans that pertain to it would constitute a risk to the public or to public security, I further move that the Mayor and Council close the Council Meeting of November 19, 2018 in order to participate in security training and to discuss specifics of an emergency plan which pertains to the City Council.

This session will be closed under the authority of the Annotated Code of Maryland State Government General Provisions Article Section 3-305(b) (10) to discuss public security, including (i) the deployment of fire and police services and staff and (ii) the development and implementation of emergency plans.

#### **Sponsor(s):**

At the Request of the City Administrator

#### **Co-Sponsor(s):**

N/A

### **ATTACHMENTS**

#### **Summary Background:**

N/A

#### **Next Steps:**

N/A

#### **Fiscal Impact:**

N/A

#### **City Administrator Comments:**

Recommend Approval

#### **Community Engagement:**

N/A

**Strategic Goals:**

N/A

**Legal Review Required?**

Complete.



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Presentation

Agenda Section: Presentations (8:20 p.m. - 8:30 p.m.)

### **SUBJECT**

Presentation of Proclamation in Honor of Councilmember Paula Perry (5 minutes)

### **HCC-142-FY19**

### **Recommendation:**

### **Sponsor(s):**

At the Request of the City Administrator

### **Co-Sponsor(s):**

N/A

### **ATTACHMENTS**

### **Summary Background:**

Mayor Hollingsworth will present a proclamation and token of appreciation to Councilmember Paula Perry in honor of her service to the City of Hyattsville.

### **Next Steps:**

N/A

### **Fiscal Impact:**

N/A

### **City Administrator Comments:**

Recommend Approval

### **Community Engagement:**

N/A

### **Strategic Goals:**

Goal 4 – Foster Excellence in all City Operations

### **Legal Review Required?**

N/A



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Ron Brooks

Submitting Department: Finance

Item Type: Audit

Agenda Section: Presentations (8:20 p.m. - 8:30 p.m.)

### **SUBJECT**

FY17 Audit Update (5 minutes)

**HCC-149-FY19**

### **Recommendation:**

### **Sponsor(s):**

At the Request of the City Administrator

### **Co-Sponsor(s):**

N/A

### **ATTACHMENTS**

### **Summary Background:**

The FY17 audit is moving into the last phase. Auditors are still working through their review of appropriations associated with approved City contracts and testing the City's procurement process for awarding contracts. The review of budget versus actual for all funds continues. Our goal is to complete the audit by the end of this calendar year, however, we are approaching the holiday period which may impact the process/progress.

### **Next Steps:**

Continue to work through the audit until completion.

### **Fiscal Impact:**

Late audit filings can result in loss of State Grants and loss of revenues from the State of Maryland.

### **City Administrator Comments:**

See summary above.

### **Community Engagement:**

N/A

### **Strategic Goals:**

Goal 1 – Ensure Transparent and Accessible Governance

### **Legal Review Required?**

N/A



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Legislative

Agenda Section: Consent Items (8:30 p.m. - 8:35 p.m.)

### **SUBJECT**

2019 Council Regular & Budget Meeting Calendar

### **HCC-120-FY19**

#### **Recommendation:**

I move that the Mayor and Council adopt the 2019 Council Meeting Schedule and the FY-2020 Budget Meeting Schedule, as presented.

#### **Sponsor(s):**

At the Request of the City Administrator

#### **Co-Sponsor(s):**

N/A

### **ATTACHMENTS**

[2019 Council Meeting Calendar\\_Final.pdf](#)

#### **Summary Background:**

Please see attached draft meeting schedule.

#### **Next Steps:**

Upon adoption, the Council Meeting calendar will be published on the City's website and posted in the Municipal Building.

#### **Fiscal Impact:**

N/A

#### **City Administrator Comments:**

Recommend Approval

#### **Community Engagement:**

Council meeting agendas are posted a minimum of 48 hours in advance of each meeting. Subscribers to the City's Notify Me system also receive email and text alerts when meeting agendas are posted.

#### **Strategic Goals:**

Goal 1 - Ensure Transparent and Accessible Governance

#### **Legal Review Required?**

Complete



## CITY OF HYATTSVILLE, MD

### 2019 COUNCIL REGULAR & BUDGET MEETING SCHEDULE

*This schedule may be subject to change. The first and third Monday of the month are reserved for City Council Meetings per City Charter. Meetings & Work Sessions begin at 8:00 p.m. unless otherwise noted. Adopted by the Mayor & Council on Monday, November 19, 2018.*

| JANUARY   |    |         |                                                                                      | JUNE      |    |         |                                                            |
|-----------|----|---------|--------------------------------------------------------------------------------------|-----------|----|---------|------------------------------------------------------------|
| Monday    | 7  | 8:00 PM | Regular Council Meeting                                                              | Monday    | 3  | 8:00 PM | Regular Council Meeting                                    |
| Tuesday   | 22 | 8:00 PM | Regular Council Meeting: <i>FY20 Council Budget Priorities</i>                       |           |    |         |                                                            |
| FEBRUARY  |    |         |                                                                                      | JULY      |    |         |                                                            |
| Monday    | 4  | 8:00 PM | Regular Council Meeting                                                              | Monday    | 15 | 8:00 PM | Regular Council Meeting                                    |
| Tuesday   | 19 | 8:00 PM | Regular Council Meeting                                                              |           |    |         |                                                            |
| Wednesday | 27 | 8:00 PM | Budget Work Session: <i>FY20 Departmental Presentations</i>                          | AUGUST    |    |         |                                                            |
| MARCH     |    |         |                                                                                      | Monday    | 5  | 8:00 PM | Regular Council Meeting                                    |
| Monday    | 4  | 8:00 PM | Regular Council Meeting: <i>Introduction, FY20 Budget</i>                            |           |    |         |                                                            |
| Wednesday | 13 | 8:00 PM | Budget Work Session: <i>FY20 Departmental Presentations</i>                          | SEPTEMBER |    |         |                                                            |
| Monday    | 18 | 8:00 PM | Regular Council Meeting                                                              | Monday    | 16 | 8:00 PM | Regular Council Meeting                                    |
| Wednesday | 27 | 8:00 PM | Budget Work Session: <i>Council Budget Amendments</i>                                |           |    |         |                                                            |
| APRIL     |    |         |                                                                                      | OCTOBER   |    |         |                                                            |
| Monday    | 1  | 7:30 PM | Public Hearing: <i>FY20 Real Property Tax Rate</i>                                   | Monday    | 7  | 8:00 PM | Regular Council Meeting                                    |
| Monday    | 1  | 8:00 PM | Regular Council Meeting                                                              | Monday    | 21 | 8:00 PM | Regular Council Meeting                                    |
| Monday    | 15 | 8:00 PM | Regular Council Meeting: <i>1st Reading of FY20 Budget</i>                           | NOVEMBER  |    |         |                                                            |
| MAY       |    |         |                                                                                      | Monday    | 4  | 8:00 PM | Regular Council Meeting                                    |
| Monday    | 6  | 8:00 PM | Regular Council Meeting: <i>Adoption of FY20 Budget</i>                              | Monday    | 18 | 8:00 PM | Regular Council Meeting                                    |
| Monday    | 20 | 7:00 PM | Regular Council Meeting                                                              |           |    |         |                                                            |
| Monday    | 20 | 8:00 PM | Regular Council Meeting: <i>Newly Elected Council Member Oath of Office Ceremony</i> | DECEMBER  |    |         |                                                            |
|           |    |         |                                                                                      | Monday    | 2  | 8:00 PM | Regular Council Meeting                                    |
|           |    |         |                                                                                      | Wednesday | 11 | 8:00 PM | Budget Work Session: <i>FY21 Council Budget Priorities</i> |
|           |    |         |                                                                                      | Monday    | 16 | 8:00 PM | Regular Council Meeting                                    |



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Appointment

Agenda Section: Consent Items (8:30 p.m. - 8:35 p.m.)

### **SUBJECT**

Re-Appointment to the Hyattsville Environment Committee

### **HCC-118-FY19**

#### **Recommendation:**

I move that the Mayor and Council re-appoint Daniel Broder (Ward 2) to the Hyattsville Environment Committee for a term of 2 years to expire on November 19, 2020.

#### **Sponsor(s):**

Perry

#### **Co-Sponsor(s):**

N/A

### **ATTACHMENTS**

[Committee Application\\_HEC\\_Daniel Broder W2.pdf](#)

#### **Summary Background:**

Please see attached application.

#### **Next Steps:**

Staff liaisons for HEC Committee will reach out to the appointee to invite them to attend the next meeting.

#### **Fiscal Impact:**

N/A

#### **City Administrator Comments:**

Recommend Approval

#### **Community Engagement:**

Agendas for the HEC Meetings are posted on the City's website. Meetings are open to the public and all are encouraged to attend.

#### **Strategic Goals:**

Goal 1 - Ensure Transparent and Accessible Governance

Action 1.1 - Provide Information and Opportunities for Resident Participation in Civic Endeavors.

#### **Legal Review Required?**

N/A

**Board, Committee and Commission Application**

---

**Profile**

Daniel

First Name

Broder

Last Name

Email Address

Street Address

City

Suite or Apt

State

Postal Code

To find your City Ward, click on this link! <http://www.hyattsville.org/538/Residency-Verification-Page>

\*

☒ Ward 2

Primary Phone

Alternate Phone

**Which Boards would you like to apply for?**

---

Hyattsville Environment Committee: Submitted

Education Advisory Committee: Submitted

Referred By:

---

**Biographical Statement**

---

My name is Daniel Broder and my wife and I moved to Hyattsville in the summer of 2016. I am eager to utilize my professional skills that I have acquired in cyber security, solar power and technical writing to make contributions to the community. It would be a privilege and an honor to serve on these committees and I would be a flexible, positive, hard-worker if given the opportunity. Please let me know if you have any additional questions.

---





## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Appointment

Agenda Section: Consent Items (8:30 p.m. - 8:35 p.m.)

### SUBJECT

Appointments to the Compensation Review Committee

**HCC-145-FY19**

### Recommendation:

I move that the Mayor, with Council approval, appoint Desa Foster (Ward 1), Gregory Barnes (Ward 1), Kristina Alayan (Ward 2), Marialis Zmuda (Ward 2), Dean Thorp (Ward 3), Sarah Lawler (Ward 4), Cliff Mayo (Ward 5), and Chip Clarke (Ward 5) to the Compensation Review Committee.

### Sponsor(s):

Hollingsworth

### Co-Sponsor(s):

N/A

### ATTACHMENTS

[Committee Application\\_CRC\\_Desha Foster W1.pdf](#)

[Committee Application\\_CRC\\_Gregory Barnes W1.pdf](#)

[Committee Application\\_CRC\\_Kristina Alayan W2.pdf](#)

[Committee Application\\_CRC\\_Marialis Zmuda W2.pdf](#)

[Committee Application\\_CRC\\_Dean Thorp W3.pdf](#)

[Committee Application\\_CRC\\_Sarah Lawler W4.pdf](#)

[Committee Application\\_CRC\\_Cliff Mayo W5.pdf](#)

[Committee Application\\_CRC\\_Chip Clarke W5.pdf](#)

### Summary Background:

Every four (4) years, at least one hundred and eighty (180) days prior to a mayoral election, the Mayor shall appoint, with Council approval, a seven (7) person committee whose membership shall be comprised of at least one member from each Ward of the City, to review and make recommendations for the compensation of both the Mayor to be elected in the next municipal election and all City Council members serving during that upcoming four year term. The Compensation Review Committee shall make its recommendation as to any compensation increase, decrease or lack of change, in the existing compensation to the Mayor and City Council at least ninety (90) days prior to the election. The Mayor and Council shall have no power to alter or amend the Commission's recommendation, but shall either accept or reject it, by motion, resolution or ordinance.

**Next Steps:**

Upon appointment, the staff liaison will reach out to the appointee to inform them of their appointment. Please note all meetings of the committee are open to the public.

**Fiscal Impact:**

N/A

**City Administrator Comments:**

Recommend Support

**Community Engagement:**

Agendas for the Compensation Review Committee Meetings will be posted on the City's website. Meetings are open to the public and all are encouraged to attend.

**Strategic Goals:**

Goal 1 - Ensure Transparent and Accessible Governance

Action 1.1 - Provide Information and opportunities for resident participation in civic endeavors.

**Legal Review Required?**

N/A

**Board, Committee and Commission Application**

---

**Profile**

Desa

First Name

Foster

Last Name

Email Address

Street Address

City

Suite or Apt

State

Postal Code

To find your City Ward, click on this link! <http://www.hyattsville.org/538/Residency-Verification-Page>

\*

☒ Ward 1

Primary Phone

Alternate Phone

**Which Boards would you like to apply for?**

---

Compensation Review Committee: Submitted

Referred By:

---

**Biographical Statement**

---

I have been a resident of Hyattsville in ward 1 for over 13 years. During my residency, I have served as a volunteer in many roles including: Election Judge, Chief Election Judge, CERT member, Community Cafe (First United Methodist Church), Parent Volunteer BOA Troop 224. I have a passion for people, community and education. I consider myself a life-long learner. I often look for ways to give back. Being appointed to the Compensation Review Committee will allow me to create a synergy of my passions and strengths while serving the community I have come to love.

---

**Board, Committee and Commission Application**

---

**Profile**

Gregory

First Name

Barnes

Last Name

Email Address

Street Address

City

Suite or Apt

State

Postal Code

To find your City Ward, click on this link! <http://www.hyattsville.org/538/Residency-Verification-Page>

\*

☒ Ward 1

Primary Phone

Alternate Phone

**Which Boards would you like to apply for?**

---

Compensation Review Committee: Submitted

Referred By:

---

**Biographical Statement**

---

I have a bachelor's degree in economics, a law degree as well as a master's degree in public policy. I have spent much of my career working in public service focused primarily on state and federal issues. Recently, I've decided to dedicate more of my attention to local matters, since those issues tend to have a greater impact on our daily lives. Serving on the Compensation Review Committee would provide me with a meaningful opportunity to give back to the community. If needed, I'm happy to serve.

---

**Board, Committee and Commission Application**

---

**Profile**

Kristina

First Name

Alayan

Last Name

Email Address

Street Address

City

Suite or Apt

State

Postal Code

To find your City Ward, click on this link! <http://www.hyattsville.org/538/Residency-Verification-Page>

\*

☒ Ward 2

Primary Phone

Alternate Phone

**Which Boards would you like to apply for?**

---

Compensation Review Committee: Submitted

City News &amp; Events

Announcement (I subscribe)

Referred By:

**Biographical Statement**

---

I have always been informally involved with my community whether it's volunteering, neighborhood meetings, or block parties. A neighbor spoke highly of her experience participating formally with the city, and after living in Hyattsville for the past three years, I'd like to do the same. Based on the time commitment outlined, I would not only be able to meet my obligations, but would also be an asset to the committee as someone who cares deeply and looks forward to being a more active, formal part of what makes our community so special. Thanks for considering!

---

**Board, Committee and Commission Application**

---

**Profile**

marialis

First Name

zmuda

Last Name

Email Address

Street Address

City

Suite or Apt

State

Postal Code

To find your City Ward, click on this link! <http://www.hyattsville.org/538/Residency-Verification-Page>

\*

☒ Ward 2

Primary Phone

Alternate Phone

**Which Boards would you like to apply for?**

---

Compensation Review Committee: Submitted

city listserv

Referred By:

**Biographical Statement**

---

i am a licensed social worker working in PG County for several years and have lived in Hyattsville since 1978. I have been involved with HPA, HCAA, HCDC, HAP and have been cited twice as Volunteer of the Year. I am very interested in how our city functions and look forward to working on the Compensation Review Committee.

---

**Board, Committee and Commission Application**

---

**Profile**

Dean

First Name

Thorp

Last Name

Email Address

Street Address

City

Suite or Apt  
State

Postal Code

To find your City Ward, click on this link! <http://www.hyattsville.org/538/Residency-Verification-Page>

\*

☒ Ward 3

Primary Phone

Alternate Phone

**Which Boards would you like to apply for?**

---

Compensation Review Committee: Submitted

Referred By:

---

**Biographical Statement**

---

Retired from Wells Fargo in 2012 as Senior Vice President, Director of Philanthropy, Western US. Have resided in Hyattsville since March, 2017.

---

**Board, Committee and Commission Application**

---

**Profile**

Sarah

First Name

Lawler

Last Name

Email Address

Street Address

City

Suite or Apt  
State

Postal Code

To find your City Ward, click on this link! <http://www.hyattsville.org/538/Residency-Verification-Page>

\*

☒ Ward 4

Primary Phone

Alternate Phone

**Which Boards would you like to apply for?**

---

Compensation Review Committee: Submitted

Meg Libby-Mueller

Referred By:

**Biographical Statement**

---

I have lived in Hyattsville for 6 years and have been in the DC area for 20+ years. My professional background is in the nonprofit sector primarily doing marketing and communications.

---



Profile

Cliff

Mayo

First Name

Last Name

Email Address

Street Address

Suite or Apt

City

State

Postal Code

To find your City Ward, click on this link! <http://www.hyattsville.org/538/Residency-Verification-Page>

\*

☒ Ward 5

Primary Phone

Alternate Phone

Which Boards would you like to apply for?

Compensation Review Committee: Submitted

Referred By:

Biographical Statement

I am interested in making sure our city government officials are fairly compensated for their service. I have professional experience in organizational management and researching comparable positions.

**Board, Committee and Commission Application**

---

**Profile**

Chip Clarke

First Name

Clarke

Last Name

Email Address

Street Address

City

Suite or Apt

State

Postal Code

To find your City Ward, click on this link! <http://www.hyattsville.org/538/Residency-Verification-Page>

\*

☒ Ward 5

Primary Phone

Alternate Phone

**Which Boards would you like to apply for?**

---

Compensation Review Committee: Submitted

Referred By:

**Biographical Statement**

---

I have a background in accounting and financial analysis and am interested in learning more about the mayoral and council member positions and responsibilities, in particular, and also how the city operates in general.

---



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Hal Metzler

Submitting Department: Public Works

Item Type: Budget

Agenda Section: Consent Items (8:30 p.m. - 8:35 p.m.)

### SUBJECT

DPW Facility New Construction Project - Purchase of Lifts

### HCC-33-FY19

#### Recommendation:

I move that the Mayor and Council authorize an expenditure not to exceed \$250,000 with Stertil-Koni, USA for the purchase of a Stertil-Koni Skylift Sky200 and a Stertil-Koni ECO 60-13 heavy equipment lifts, including installation and training, for the new DPW Facility.

#### Sponsor(s):

At the Request of the City Administrator

#### Co-Sponsor(s):

N/A

### ATTACHMENTS

[City of Hyattsville - new facility - 080118 \(003\).pdf](#)

[Stertil-Koni Contract 061015.pdf](#)

[Acceptance and Award-Stertil-Koni-061015.pdf](#)

#### Summary Background:

Council previously approved this request at the September 11, 2018 meeting as item HCC-33-FY19 and now the administration is seeking to change the name of the vendor to Stertil-Koni USA. This company manufactures the equipment and will be the receiving payment of \$250,000. After Stertil-Koni USA receives payment the equipment will be provided thru Alan Tye & Associates, the local vendor of the Stertil-Koni Skylift Sky200 and the Stertil-Koni ECO 60-13 heavy vehicle lifts selected by Fleet Management staff for inclusion at the new DPW facility. Stertil-Koni, USA through their distributor, Alan Tye & Associates, provided pricing for the lifts, installation, and training through the National Joint Powers Alliance, of which the City is a member.

#### Next Steps:

Issue Purchase Order

#### Fiscal Impact:

\$250,000

#### City Administrator Comments:

Recommend Approval

#### Community Engagement:

No additional outreach planned at this time.

**Strategic Goals:**

Goal 2 – Ensure the Long-Term Economic Viability of the City

**Legal Review Required?**

N/A



9669-D Main Street  
Fairfax, VA 22031  
1-800-347-3440  
[www.alantylifts.com](http://www.alantylifts.com)



**SALES ♦ SERVICE ♦ INSTALLATION ♦ SAFETY INSPECTIONS**

Date: August 1, 2018

Lenny Nemec  
703-408-9398  
[Lenny@alantylifts.com](mailto:Lenny@alantylifts.com)

**Proposal for**

**City of Hyattsville New Maintenance Facility**

City of Hyattsville  
4633 Arundel Place  
Hyattsville, MD. 20781  
Attention: Hal Metzler  
240.832.6959

**Pricing based upon National Joint Powers Alliance (NJPA) contract 061015-SK1**

Issuance of NJPA Purchase Orders & Payment to: Stertil-Koni, USA [orders@stertil-koni.com](mailto:orders@stertil-koni.com)

**1. Equipment - Furnish Stertil-Koni Heavy Duty Surface Mounted Skylift, SKY 200- 30' =**

**List Price = \$144,661.00**

**Unit Price = \$102,746.00**

- Model Number 4124000
- 62,400 lbs. capacity
- Platform length 30'
- Stertil-Guard Anti-skid applied at factory
- Anti-Skid plates
- LED lighting set, UL approved
- 2 Air Kits with 8' pipe, brackets, and 1 outlet each
- 2 Jacking Beams 200-2 air / hydraulic, capacity 44,000 lbs., width 33.5" – 45.28"
- 2 Sets of Support Arms for Jacking Beams
- ALI/ETI Certified

**Installation and Training =**

**Unit Price = \$17,296.00**

**2. Equipment - Furnish Stertil-Koni Heavy Duty ECO60-13 Lift =**

**List Price = \$144,606.00**

**Unit Price = \$101,782.00**

- Model Number ECO60-13
- 60,000 lbs. total capacity
- 13 ft. travel range
- Cover plates
- Detachable wired remote control
- Adapter cart
- ALI/ETI Certified

Installation and Training =

Unit Price = \$16,828.00

| Price Summary                       |              |              |              |
|-------------------------------------|--------------|--------------|--------------|
|                                     | List Price   | Unit Price   | Total        |
| #1 Equipment – Skylift 200 – 30' SM | \$144,661.00 | \$102,746.00 |              |
| #1 Installation                     |              | \$17,296.00  |              |
| #1 Total Price                      |              |              | \$120,042.00 |
| #2 Equipment – ECO 60-13            | \$144,06.00  | \$101,782.00 |              |
| #2 Installation                     |              | \$16,828.00  |              |
| #2 Total Price                      |              |              | \$118,610.00 |
| Total                               |              |              | \$238,652.00 |

**\*\*Note – Pricing does not include taxes.**

**Exclusions:**

1. All construction.
2. Electric and compressed air to be provided to lift control console by others.
3. Quote excludes cost of any required bonds, or taxes.
4. Quote excludes cost of any required permits or cost of certified shop drawings needed to obtain permits.
5. Quote excludes certified payrolls.
6. Quote excludes payment and performance bonds.

**Customer Installation Responsibilities:**

1. Provide clear and unobstructed unloading area, within close proximity (not to exceed 100'-0) to the installation area.
2. Provide clear/unobstructed path from receiving area (*loading dock if available*) to installation area.
3. Provide clear and unobstructed workspace for the staging of items and the safe and effective installation of the unit(s).
4. Provide access (not to exceed 100'-0) to 110 V AC power for operation of power tools, etc.
5. Provide access to a dumpster for the disposal of all trash.
6. Debris removal and costs associated are the responsibility of the client, unless specifically noted in this offer.
7. Provide, without cost, a secure parking area for installation technician vehicles.

Terms: Due Upon Receipt

1. Issuance of Purchase Orders & Payment to:  
**Stertil-Koni, USA** [orders@sterdil-koni.com](mailto:orders@sterdil-koni.com)
2. Quote valid until September 29, 2018.

Any and all applicable taxes are purchaser responsibility.



9669-D Main Street  
Fairfax, VA 22031  
1-800-347-3440  
[www.alantylifts.com](http://www.alantylifts.com)



SALES ♦ SERVICE ♦ INSTALLATION ♦ SAFETY INSPECTIONS

ACCEPTANCE:

---

---

**Form C**

**EXCEPTIONS TO PROPOSAL, TERMS, CONDITIONS  
AND SOLUTIONS REQUEST**

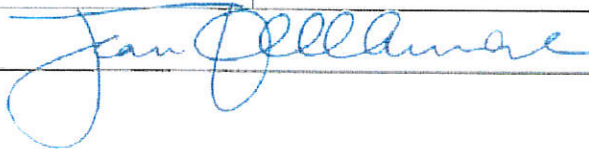


Company Name: Steril-Koni USA, Inc.

Note: **Original must be signed** and inserted in the inside front cover pouch.

Any exceptions to the Terms, Conditions, Specifications, or Proposal Forms contained herein shall be noted in writing and included with the proposal submittal. Proposer acknowledges that the exceptions listed may or may not be accepted by NJPA and may or may not be included in the final contract. NJPA may clarify exceptions listed here and document the results of those clarifications in the appropriate section below.

| Section/page    | Term, Condition, or Specification | Exception | NJPA ACCEPTS |
|-----------------|-----------------------------------|-----------|--------------|
| Not applicable. |                                   |           |              |
|                 |                                   |           |              |
|                 |                                   |           |              |
|                 |                                   |           |              |
|                 |                                   |           |              |
|                 |                                   |           |              |
|                 |                                   |           |              |
|                 |                                   |           |              |

Proposer's Signature:  Date: 6/5/15

Please note that a signed hard copy of the signature page appears in Section 2 of the RFP binder.





Contract Award  
RFP #061015

**FORM D**



**Formal Offering of Proposal**  
(To be completed Only by Proposer)

**FLEET-RELATED MAINTENANCE EQUIPMENT, SUPPLIES, SERVICES, AND INVENTORY MANAGEMENT SOLUTIONS**

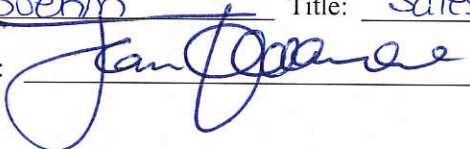
In compliance with the Request for Proposal (RFP) for FLEET-RELATED MAINTENANCE EQUIPMENT, SUPPLIES, SERVICES, AND INVENTORY MANAGEMENT SOLUTIONS, the undersigned warrants that I/we have examined this RFP and, being familiar with all of the instructions, terms and conditions, general specifications, expectations, technical specifications, service expectations and any special terms, do hereby propose, fully commit and agree to furnish the defined equipment/products and related services in full compliance with all terms, conditions of this RFP, any applicable amendments of this RFP, and all Proposer's Response documentation. Proposer further understands they accept the full responsibility as the sole source of responsibility of the proposed response herein and that the performance of any sub-contractors employed by the Proposer in fulfillment of this proposal is the sole responsibility of the Proposer.

Company Name: Sterti-Koni USA, Inc Date: June 4, 2015

Company Address: 200 log Canoe Circle

City: Stevensville State: MD Zip: 21166

Contact Person: Kellie Boehm Title: Sales & Marketing

Authorized Signature (ink only):  Jean DeLuca  
(Name printed or typed)



Contract Acceptance and Award

(To be completed only by NJPA)

**NJPA 061015 FLEET-RELATED MAINTENANCE EQUIPMENT, SUPPLIES, SERVICES, AND INVENTORY MANAGEMENT SOLUTIONS**

Stertil-Koni USA, Inc.  
Proposer's full legal name

Your proposal is hereby accepted and awarded. As an awarded Proposer, you are now bound to provide the defined product/equipment and services contained in your proposal offering according to all terms, conditions, and pricing set forth in this RFP, any amendments to this RFP, your Response, and any exceptions accepted or rejected by NJPA on Form C.

The effective start date of the Contract will be July 21<sup>st</sup>, 20 15 and continue for four years from the board award date. This contract has the consideration of a fifth year renewal option at the discretion of NJPA.

National Joint Powers Alliance® (NJPA)

NJPA Authorized signature: [Signature] Dr. Chad Coquette  
NJPA Executive Director (Name printed or typed)

Awarded this 21<sup>st</sup> day of July, 20 15 NJPA Contract Number 061015-SK1

NJPA Authorized signature: [Signature] Scott Veronen  
NJPA Board Member (Name printed or typed)

Executed this 21<sup>st</sup> day of July, 20 15 NJPA Contract Number 061015-SK1

Proposer hereby accepts contract award including all accepted exceptions and NJPA clarifications identified on FORM C.

Vendor Name Stertil-Koni USA, Inc.

Vendor Authorized signature: [Signature] Sean DeuAmore  
Title: President (Name printed or typed)

Executed this 23<sup>rd</sup> day of July, 20 15 NJPA Contract Number 061015-SK1

**PROPOSER ASSURANCE OF COMPLIANCE**



**Proposal Affidavit Signature Page**

**PROPOSER'S AFFIDAVIT**

The undersigned, representing the persons, firms and corporations joining in the submission of the foregoing proposal (such persons, firms and corporations hereinafter being referred to as the "Proposer"), being duly sworn on his/her oath, states to the best of his/her belief and knowledge:

1. The undersigned certifies the Proposer is submitting their proposal under their true and correct name, the Proposer has been properly originated and legally exists in good standing in its state of residence, that the Proposer possesses, or will possess prior to the delivery of any equipment/products and related services, all applicable licenses necessary for such delivery to NJPA members agencies nationally, and that they are authorized to act on behalf of, and encumber the "Proposer" in this Contract; and
2. To the best of my knowledge, no Proposer or Potential Proposer, nor any person duly representing the same, has directly or indirectly entered into any agreement or arrangement with any other Proposers, Potential Proposers, any official or employee of the NJPA, or any person, firm or corporation under contract with the NJPA in an effort to influence either the offering or non-offering of certain prices, terms, and conditions relating to this RFP which tends to, or does, lessen or destroy free competition of the Contract sought for by this RFP; and
3. The Proposer or any person on his/her behalf, has not agreed, connived or colluded to produce a deceptive show of competition in the manner of the proposal or award of the referenced contract; and
4. Neither the Proposer nor any officer, director, partner, member or associate of the Proposer, nor any of its employees directly involved in obtaining contracts with the NJPA or any subdivision of the NJPA, has been convicted of false pretenses, attempted false pretenses or conspiracy to commit false pretenses, bribery, attempted bribery or conspiracy to bribe under the laws of any state or federal government for acts or omissions after January 1, 1985; and
5. The Proposer has examined and understands the terms, conditions, scope, contract opportunity, specifications request and other documents of this solicitation and that any and all exceptions have been noted in writing and have been included with the proposal submittal; and
6. If awarded a contract, the Proposer will provide the equipment/products and/or services to qualifying members of the NJPA in accordance with the terms, conditions, scope of this RFP, Proposer offered specifications and other documents of this solicitation; and
7. The undersigned, being familiar with and understand the expectations requested and outlined in this RFP under consideration, hereby proposes to deliver through valid requests, Purchase Orders or other acceptable forms ordering and procurement by NJPA Members. Unless otherwise indicated, requested and agreed to on a valid purchase order per this RFP, only new, unused and first quality equipment/products and related services are to be transacted with NJPA Members relating to an awarded contract; and
8. The Proposer has carefully checked the accuracy of all proposed products/equipment and related services and listed total price per unit of purchase in this proposal to include shipping and delivery considerations. In addition, the Proposer accepts all general terms and conditions of this RFP, including all responsibilities of commitment as outlined and proposed; and

9. In submitting this proposal, it is understood that the right is reserved by the NJPA to reject any or all proposals and it is agreed by all parties that this proposal may not be withdrawn during a period of 90 days from the date proposals were opened regarding this RFP; and
10. The Proposer certifies that in performing this Contract they will comply with all applicable provisions of the federal, state, and local laws, regulations, rules, and orders; and
11. The Proposer understands that submitted proposals which are marked "confidential" in their entirety, or those in which a significant portion of the submitted proposal is marked "nonpublic" **will not** be accepted by NJPA. Pursuant to Minnesota Statute §13.37 only specific parts of the proposal may be labeled a "trade secret." All proposals are nonpublic until the contract is awarded; at which time, both successful and unsuccessful vendors' proposals become public information.
12. The Proposer understands and agrees that NJPA will not be responsible for any information contained within the proposal.
13. By signing below, the Proposer understands it is his or her responsibility as the Vendor to act in protection of labeled information and agree to defend and indemnify NJPA for honoring such designation. Proposer duly realizes failure to so act will constitute a complete waiver and all submitted information will become public information; additionally failure to label any information that is released by NJPA shall constitute a complete waiver of any and all claims for damages caused by the release of the information.

**[The rest of this page has been left intentionally blank. Signature page below]**



By signing below, Proposer is acknowledging that he or she has read, understands and agrees to comply with the terms and conditions specified above.

Company Name: Stertl-Koni USA, Inc

Contact Person for Questions: Kellie Boehm

(Must be individual who is responsible for filling out this Proposer's Response form)

Address: 200 Log Canoe Circle

City/State/Zip: Stevensville MD 21666

Telephone Number: 410.643.9001 Fax Number: 410.643.8901

E-mail Address: bids@stertl-koni.com

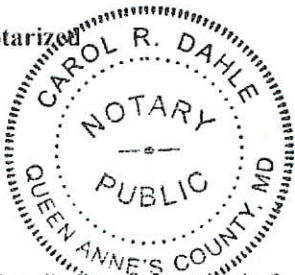
Authorized Signature: Jean Dellamore

Authorized Name (typed): Jean Dellamore

Title: President

Date: June 5, 2015

Notarized



Subscribed and sworn to before me this 5 day of June, 20 15

Notary Public in and for the County of Queen Anne's State of Maryland

My commission expires: 12/31/15

Signature: Carol R. Dahle



**PROPOSER QUESTIONNAIRE**  
**Payment Terms, Warranty, Products/Equipment/Services, Pricing and Delivery, Industry Specific**

Proposer Name: Stertil-Koni USA, Inc.

Questionnaire completed by: Kellie Boehm

**Payment Terms and Financing Options**

**1) Identify your payment terms if applicable. (Net 30, etc.)**

Stertil-Koni's payment terms are Net 30.

**2) Identify any applicable leasing or other financing options as defined herein.**

Not applicable: Stertil-Koni does not have a leasing plan or financing options available at this time.

**3) Briefly describe your proposed order process for this proposal and contract award. (Note: order process may be modified or refined during an NJPA member's final Contract phase process).**

**Please specify if you will be including your dealer network in this proposal. If so, please specify how involved they will be. (For example, will the Dealer accept the P.O.?), and how are we to verify the specific dealer is part of your network?**

The Dealer Network (Stertil-Koni's distributors) will be instrumental in the overall success of the NJPA / Stertil-Koni USA partnership and as such they will be very involved in the sales and order processing procedure.

As it relates to the specific ordering process, we strongly recommend that purchase orders from NJPA Members be issued to Stertil-Koni USA, rather than the Dealer Network. Of course, the distributors will be a main source of sales and the principle contact point with an NJPA Member as it relates to product demonstrations, setup and training, and regular customer service questions.

That said, when it comes to issuing a purchase order, our distributors will know that the purchase order process is centralized. A centralized ordering point is also how the Stertil-Koni GSA contract is set up, and that procedure has worked extremely well. In fact, over the 10 years we have held the GSA contract, all parties involved have had a very good experience with this arrangement.

There are two main reasons why we recommend a centralized ordering point:

- a) Consistency, accuracy and contract compliance.** All of our distributors are independent third parties. As such, it would be virtually impossible for Stertil-Koni USA to guarantee contract compliance as it relates to pricing, discounts and other terms and conditions if we don't see each purchase order. Thus, the only way Stertil-Koni USA can guarantee 100% compliance is by processing all orders directly.

- b) **Reporting:** Centralizing all purchase orders through Stertil-Koni USA will also ensure that all sales are included in calculating and payment of the administrative fee to NJPA.

We want to emphasize that one of Stertil-Koni USA's great strengths lies within our highly customer-oriented Dealer Network. Even though the purchasing process is centralized, all NJPA Members will receive the same level of service and follow up as if they placed their purchase orders locally.

Therefore, Stertil-Koni USA recommends that all purchase orders from NJPA Members shall be issued to Stertil-Koni USA, Inc. by:

**E-mail:** orders@stertil-koni.com

**Mail:** Stertil-Koni USA, Inc., 200 Log Canoe Circle, Stevensville, MD 21666

**Fax:** +1 410-643-8901

**4) Do you accept the P-card procurement and payment process?**

No. At the current time, Stertil-Koni does accept the P-card and payment process. However, we are open to exploring the opportunity.

**Warranty**

**5) Describe, in detail, your Manufacture Warranty Program including conditions and requirements to qualify, claims procedure, and overall structure.**

**Conditions**

The warranty period commences from the effective date of acceptance by the customer. A warranty registration form or registration card must be submitted to Stertil-Koni within 30 days of receipt of equipment to establish such date; otherwise the invoice date will become the effective date of acceptance by the customer.

**Requirements**

Stertil-Koni lifting equipment must be installed and serviced by Stertil-Koni factory trained and Stertil-Koni factory-authorized service technicians. Stertil-Koni lifting equipment not installed and serviced by Stertil-Koni factory-trained and Stertil-Koni factory-authorized service technicians will result in a voided warranty.

**Claim Procedure**

Warranty service is handled through our network of distributors. Each distributor has an assigned geographic area they are responsible to cover. To obtain warranty service, the customer needs to contact their local distributor or Stertil-Koni. A service technician will be scheduled to visit the customer's location and repair the lift. All warranty paperwork will be handled by the local distributor.

**Structure**

The local distributor will handle creating the warranty paperwork. The distributor submits the claim paperwork to Stertil-Koni for documentation and processing. Stertil-Koni has a full-time staff that manages all warranty claims, replacement parts, and associated shipping requirements. Documentation of any failed parts is provided to manufacturing as part of the supplier quality control program.

**6) Do all warranties cover all products/equipment parts and labor?**

All of our products are covered by our warranty. Our standard warranty is 1 year labor, 2 years parts and 5 years parts only on hydraulic cylinders used in our mobile lifting columns.

**7) Do warranties impose usage limit restrictions?**

We do have two instances where the warranty is limited

(a) This warranty does not apply where equipment has been damaged due to abnormal wear, misuse, overloading, accident (including shipping), improper maintenance, alteration, improper fluid maintenance, or other causes "not the result of defective materials or workmanship."

(b) Stertil-Koni lifting equipment must be installed and serviced by Stertil-Koni factory trained and Stertil-Koni factory authorized service technicians. Stertil-Koni lifting equipment not installed and serviced by Stertil-Koni factory trained and Stertil-Koni factory authorized service technicians will result in a voided warranty.

**8) Do warranties cover the expense of technicians travel time and mileage to perform warranty repairs?**

Yes, under the one (1) year labor timeframe of our warranty. Past the one (1) year, technicians' travel and time is billable.

**9) Please list any other limitations or circumstances that would not be covered under your warranty.**

Not applicable. There are no other limitations or circumstances that would not be covered under the Stertil-Koni warranty program.

**10) Please list any geographic regions of the United States for which you cannot provide a certified technician to perform warranty repairs. How will NJPA Members in these regions be provided service for warranty repair? Please provide a list of your network service providers for warranty work and repairs.**

Not applicable: Stertil-Koni covers all geographic regions of the U.S. Warranty service is handled through our network of distributors. Each distributor has an assigned geographic area they are responsible to cover. See the distributor listing.

| Distributor                   | Territory Covered                                                                    |
|-------------------------------|--------------------------------------------------------------------------------------|
| Alan Tye & Associates         | Delaware, North Carolina, Maryland, Virginia, Washington DC, Kentucky, West Virginia |
| Antilles Power                | Puerto Rico                                                                          |
| Champion Marketing            | Virgin Islands                                                                       |
| CTT Equipment                 | Michigan                                                                             |
| D & J Equipment               | North Dakota, Southeast South Dakota, Eastern Montana, Northeast Wyoming             |
| D.L. Carr                     | New York, Long Island and upper state                                                |
| Heavy Duty Lift & Equipment   | South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee                    |
| Heavy Lift Systems            | Ohio                                                                                 |
| Hoffman Services              | New Jersey                                                                           |
| Kubat Equipment               | Colorado, Southern Wyoming                                                           |
| Lift Logic                    | Alaska, Oregon, Washington, Western Montana, Idaho                                   |
| Lou Cardoza Enterprises       | Hawaii, Guam                                                                         |
| Malchi Automotive & Equipment | Oklahoma, Northwest Arkansas                                                         |
| Midwest Equipment             | Northern Illinois, Southern Wisconsin                                                |
| Midwest Equipment Specialist  | Wisconsin                                                                            |
| Midwest Lift Works            | Minnesota, Western Wisconsin, Northern Iowa                                          |



|                                 |                                                                         |
|---------------------------------|-------------------------------------------------------------------------|
| Municipal Maintenance Equipment | Northern California, Northern Nevada                                    |
| Neumayer Equipment              | St. Louis, Missouri                                                     |
| Novaquip                        | Ontario, Newfoundland, Quebec                                           |
| PB Hoidale                      | Wichita, Kansas                                                         |
| Performance Tool                | New Mexico, El Paso, TX                                                 |
| Petroleum Solutions             | San Antonio and surrounding areas                                       |
| Power Washer Sales              | Connecticut, Rhode Island, Massachusetts, New Hampshire, Maine, Vermont |
| Reeder Distributors             | Texas, other than San Antonio                                           |
| Safetylane Equipment            | Indiana, Illinois                                                       |
| Southwest lift & Equipment      | Southern California, Utah, Arizona, Nevada                              |
| Summit Sales                    | Kansas, Missouri                                                        |
| Vendor Network                  | New York, Five boroughs                                                 |
| Westvac Industrial              | Alberta, British Columbia, Manitoba                                     |

### **Equipment/Product/Services, Pricing, and Delivery**

#### **11) Provide a general narrative description of the equipment/products and related services you are offering in your proposal.**

Stertil Koni USA is the sales and marketing arm of a manufacturer that specializes in heavy duty lifting solutions. These lifting solutions are designed and manufactured at one of our two manufacturing locations -- Streator, Illinois and Northern Holland. With our emphasis on only heavy duty lifts, Stertil Koni can offer our customers the most innovative solutions to fully meet all their lifting needs. We call this approach "Freedom of Choice." It is our commitment to provide customers with the highest quality, most advanced and safest heavy duty lifting systems on the market. Stertil Koni lifts, with capacities ranging from 16,000 lbs. to more than 100,000 lbs., offer the appropriate lift for all applications. Along with a complete line of heavy duty lifting solutions, Stertil Koni offers complementary shop equipment for a majority of auxiliary service.

#### **12) Provide a general narrative description of your pricing model identifying how the model works (line item and/or published catalog percentage discount).**

Stertil-Koni publishes and regularly updates a price list which contains all items that will be offered to NJPA members. At the same time, there are a limited number of Open Market items, such as product installation for fixed lifts, which are not found on the published price list but are negotiated with, and agreed upon in partnership with the end user before consummation of the sale. The Purchase Order for an item of this type is always directed to Stertil-Koni.

#### **13) Please quantify the discount range presented in this response pricing as a percentage discount from MSRP/published list.**

Stertil-Koni is pleased to be provided with this opportunity by NJPA. We realize the value of purchasing contracts and look forward to a favorable outcome in our proposal to NJPA. Stertil-Koni intends to offer NJPA a very favorable discount off the list price as displayed in our published price list. The discounts on Stertil-Koni lifting systems will be as follows:

|                                               |                      |
|-----------------------------------------------|----------------------|
| For the purchase of 1 lifting system          | 29% off list price   |
| For the purchase of 2 – 7 lifting systems     | 32% off list price   |
| for the purchase of 8 or more lifting systems | 33.5% off list price |

#### **14) Provide an overall proposed statement of method of pricing for individual line items, percentage discount off published product/equipment catalogs and/or category pricing percentage discount**

**with regard to all equipment/products and related services and being proposed. Provide a SKU number for each item being proposed.**

All Stertil-Koni lifting products offered via the NJPA contract will be shown on the official company price list:

- a. At list price (Attachment 19)
- b. With the following discounts for NJPA members (Attachment 20):
  - i. For the purchase of 1 lifting system 29% off list price
  - ii. For the purchase of 2 – 7 lifting system 32% off list price
  - iii. For the purchase of 8 or more lifting system 33.5% off list price

**15) Propose a strategy, process, and specific method of facilitating “Sourced Equipment/Products and/or related Services” (AKA, “Open Market” items or “Non-Standard Options”).**

All Stertil-Koni lifting system products will be offered as part of the NJPA contract. With regard to “Open Market” items as they relate to Stertil-Koni, these typically would be for infrastructure repairs associated with fixed machinery (i.e., in-ground lifting systems, two-post, four-post and platform lifts).

In those instances:

- a. **Strategy:**
  - i. NJPA member will work with the Stertil-Koni distributor in the member’s territory to establish a fair and reasonable price for the Open Market item/s.
- b. **Process:**
  - i. Stertil-Koni’s distributor will alert Stertil-Koni to the request and communicate the details to the NJPA member and Stertil-Koni.
- c. **Specific Method:**
  - i. The NJPA member will add the agreed upon Open Market item on the PO, which is submitted directly to Stertil-Koni.

**16) Describe your NJPA customer volume rebate programs, as applicable.**

Not applicable: Stertil-Koni does not offer rebate programs at this time.

**17) Identify any Total Cost of Acquisition (as defined herein) cost(s) which is NOT included “Pricing” submitted with your proposal response. Identify to whom these charges are payable to and their relationship to Proposer.**

Total “Costs of Acquisition” charges not included in “Pricing” submitted in the Stertil-Koni proposal are:

- a. Installation of fixed equipment lifting systems (e.g., in-ground piston and scissor lifts, platform lifts, two-post and four-post lifts): These costs are Open Market costs to be agreed upon between the NJPA member and the Stertil-Koni distributor.
- b. Freight: FOB Stevensville

**18) If freight, delivery or shipping is an additional cost to the NJPA member, describe in detail the complete shipping and delivery program.**

All shipping and delivery is FOB Stevensville, at cost.

By way of further background, Stertil-Koni has a dedicated Logistics Department at the company’s headquarters in Stevensville, Maryland, that works with numerous, high-quality shipping companies throughout the United States and Canada.

With the unique shape, weight and transportation considerations of our equipment, Stertil-Koni has developed a very responsive transportation network. We have very competitive rates with all our carriers and have an outstanding record of less than 0.1% in freight damage using our methods.

In sum, Stertil-Koni does not markup freight charges, only invoicing for exact charges for equipment shipments.

**19) As an important part of the evaluation of your offer, indicate the level of pricing you are offering.**

**Prices offered in this proposal are:**

\_\_\_\_\_ a. Pricing is the same as typically offered to an individual municipality, Higher Ed or school district.

☒ b. Pricing is the same as typically offered to GPOs, cooperative procurement organizations or state purchasing departments.

\_\_\_\_\_ c. Better than typically offered to GPOs, cooperative procurement organizations or state purchasing departments.

\_\_\_\_\_ d. Other; please describe.

**20) Do you offer quantity or volume discounts?**

☒ YES \_\_\_\_\_ NO Outline guidelines and program.

Stertil-Koni offers the following volume discounts on lifting systems:

|                                               |                      |
|-----------------------------------------------|----------------------|
| For the purchase of 1 lifting system          | 29% off list price   |
| For the purchase of 2 – 7 lifting systems     | 32% off list price   |
| For the purchase of 8 or more lifting systems | 33.5% off list price |

**21) Describe in detail your proposed exchange and return program(s) and policy(s).**

The advanced heavy duty lifting systems and related products offered by Stertil Koni to NJPA members are provided after the completion of a comprehensive consultative sales process. Stertil Koni, and our network of dedicated distributors, pride ourselves on the level of interaction we have with our customers to ensure the end user gets the specific equipment to fit his or her needs. As such, Stertil Koni has not experienced the need to take product back as returned. But, rest assured that customer satisfaction is the controlling principle at Stertil Koni; and, if we could not satisfy the customer, we would gladly allow the product to be returned with no penalties. If a product needed to be exchanged due to a problem that could not be remedied in the field, Stertil-Koni would exchange this product for an identical product and provide shipping both ways for the exchanged product.

**22) Specifically identify those shipping and delivery and exchange and returns programs as they relate to Alaska and Hawaii and any related off shore delivery of contracted products/ equipment and related services**

Stertil Koni products offered to NJPA members are priced FOB Stertil-Koni in Stevensville, Maryland. As such, the original expense to ship product to the user is paid by the user at the time of sale. This includes all locations. In accordance with the exchange and return policy stated above, and to ensure radical customer service, Stertil Koni would provide for shipping as needed to return or exchange a product which did not satisfy the end user (at SK expense).

**23) Please describe any self-audit process/program you plan to employ to verify compliance with your anticipated contract with NJPA. Please be as specific as possible.**

In order to ensure contract compliance and proactively avoid potential errors, Stertil-Koni has established procedures and systems in place. These procedures and systems were driven in part to fully comply with

existing purchasing contracts, such as Stertil-Koni USA's GSA schedule. Regarding the order processing side of the business, we have multiple checkpoints in place.

- a) The purchase orders from NJPA customers will be reviewed by two different members of the staff.
- b) All customer purchase orders are also checked for pricing, discount and all other terms and conditions before the order is entered into the SAP system. We have implemented this order entry review process to catch pricing and discount anomalies prior to the order being inputted into our system.
- c) Finally, we check the invoice for pricing and discount compliance before the invoice is sent to the customer. Consequently, if there should be an error in the original quote, an error in the purchase order from the NJPA customer, or an incorrect order entry input on Stertil-Koni USA's end, it will be discovered in our billing department before we create the invoice.

Regarding sales reporting to NJPA and contract fees payable to NJPA, we will "tag" all sales arriving from the NJPA contract with a special code in SAP. The tagging will be done in the Order Entry Department. This process will not be unique to NJPA, but is part of all order entries. This is also the same procedure and system we are currently using for GSA sales and contract fee reporting. A recent GSA audit confirmed that the procedures and systems we have in place are working very well. The GSA auditor was very pleased with the audit, the procedures and systems in place at Stertil-Koni USA.

### **Industry-Specific Items**

#### **24) Describe your on-site inventory management solution, if applicable.**

Not applicable: Stertil-Koni does not maintain an inventory management solution on-site for customers. That said, Stertil-Koni does maintain a robust inventory management solution (powered by SAP) at the company's warehouse location in Stevensville, Maryland and another inventory management system at our factory in Streator, Illinois.

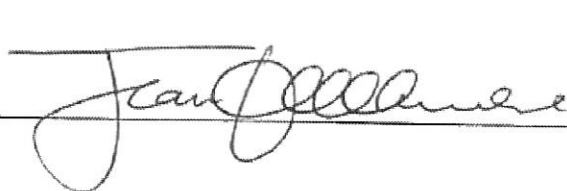
#### **25) If you are proposing an on-site inventory management solution, can you customize it based on NJPA member requests? If so, please provide an example(s) of when and how you have done this.**

Not applicable: Stertil-Koni is not proposing an on-site inventory management system for customers of our lifting systems.

#### **26) What is your parts fill rate, if applicable?**

The Stertil-Koni parts fill rate from our headquarters location in Stevensville, Maryland, is 93%. We do not have a parts fill rate associated with customer locations.

Signature: \_\_\_\_\_



Date: \_\_\_\_\_

6/5/15

Please note that a signed hard copy of the signature page appears in Section 1 of the RFP binder.



Contract Award  
RFP #061015

**FORM D**



**Formal Offering of Proposal**  
(To be completed Only by Proposer)

FLEET-RELATED MAINTENANCE EQUIPMENT, SUPPLIES, SERVICES, AND INVENTORY MANAGEMENT SOLUTIONS

In compliance with the Request for Proposal (RFP) for FLEET-RELATED MAINTENANCE EQUIPMENT, SUPPLIES, SERVICES, AND INVENTORY MANAGEMENT SOLUTIONS, the undersigned warrants that I/we have examined this RFP and, being familiar with all of the instructions, terms and conditions, general specifications, expectations, technical specifications, service expectations and any special terms, do hereby propose, fully commit and agree to furnish the defined equipment/products and related services in full compliance with all terms, conditions of this RFP, any applicable amendments of this RFP, and all Proposer's Response documentation. Proposer further understands they accept the full responsibility as the sole source of responsibility of the proposed response herein and that the performance of any sub-contractors employed by the Proposer in fulfillment of this proposal is the sole responsibility of the Proposer.

Company Name: Stertil-Koni USA, Inc Date: June 4, 2015

Company Address: 200 Log Canoe Circle

City: Stevensville State: MD Zip: 21166

Contact Person: Kellie Boehm Title: Sales & Marketing

Authorized Signature (ink only): [Signature] Sean DeLuAmore  
(Name printed or typed)



Contract Acceptance and Award

(To be completed only by NJPA)

**NJPA 061015 FLEET-RELATED MAINTENANCE EQUIPMENT, SUPPLIES, SERVICES, AND INVENTORY MANAGEMENT SOLUTIONS**

Stertil-Koni USA, Inc.  
Proposer's full legal name

Your proposal is hereby accepted and awarded. As an awarded Proposer, you are now bound to provide the defined product/equipment and services contained in your proposal offering according to all terms, conditions, and pricing set forth in this RFP, any amendments to this RFP, your Response, and any exceptions accepted or rejected by NJPA on Form C.

The effective start date of the Contract will be July 21<sup>st</sup>, 2015 and continue for four years from the board award date. This contract has the consideration of a fifth year renewal option at the discretion of NJPA.

National Joint Powers Alliance® (NJPA)

NJPA Authorized signature: [Signature] Dr. Chad Coquette  
NJPA Executive Director (Name printed or typed)

Awarded this 21<sup>st</sup> day of July, 2015 NJPA Contract Number 061015-SK1

NJPA Authorized signature: [Signature] Scott Veronen  
NJPA Board Member (Name printed or typed)

Executed this 21<sup>st</sup> day of July, 2015 NJPA Contract Number 061015-SK1

Proposer hereby accepts contract award including all accepted exceptions and NJPA clarifications identified on FORM C.

Vendor Name Stertil-Koni USA, Inc.

Vendor Authorized signature: [Signature] Sean DeAmore  
Title: President (Name printed or typed)

Executed this 23<sup>rd</sup> day of July, 2015 NJPA Contract Number 061015-SK1



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Nicola Konigkramer

Submitting Department: Legislative

Item Type: Proclamation

Agenda Section: Consent Items (8:30 p.m. - 8:35 p.m.)

### **SUBJECT**

Proclamation in Recognition of Councilmember Paula J. Perry

### **HCC-155-FY19**

#### **Recommendation:**

I move that the Mayor and Council adopt a proclamation in recognition of Councilmember Paula J. Perry's dedicated service to the City of Hyattsville.

#### **Sponsor(s):**

At the Request of the City Administrator

#### **Co-Sponsor(s):**

N/A

### **ATTACHMENTS**

[Proclamation\\_Paula\\_J.\\_Perry \(3\).docx](#)

#### **Summary Background:**

Mayor Hollingsworth will present a proclamation of appreciation to Councilmember Paula J. Perry for her dedication and years of service to the City of Hyattsville.

#### **Next Steps:**

N/A

#### **Fiscal Impact:**

N/A

#### **City Administrator Comments:**

Recommend Approval

#### **Community Engagement:**

N/A

#### **Strategic Goals:**

Goal 1 - Ensure Transparent and Accessible Governance

#### **Legal Review Required?**

N/A

# CITY OF HYATTSVILLE

## PROCLAMATION

### RECOGNIZING COUNCIL MEMBER PAULA J. PERRY'S DEDICATED SERVICE TO THE CITY OF HYATTSVILLE

This proclamation recognizes and celebrates the leadership and commitment to residents that Council Member Paula J. Perry has demonstrated throughout nearly two decades of service on Hyattsville's City Council.

**WHEREAS**, Paula J. Perry, who has made Hyattsville her home for 40 years, has served continuously on Hyattsville's City Council since 1999; and

**WHEREAS**, Council Member Perry has shown longstanding dedication to constituent services;

**WHEREAS**, Council Member Perry has championed community policing and public safety through her continued support of the City's Police and Public Safety Citizens' Advisory Committee and the City's Code Compliance Committee; and

**WHEREAS**, In her own eyes, Council Member Perry's accomplishments are not accomplishments but benefits brought to residents as part of the job she was elected to do;

**NOW, THEREFORE BE IT RESOLVED**, that this City's Mayor, Council, staff, and residents extend their most sincere appreciation and best wishes to Councilmember Paula J. Perry as she prepares to retire from Hyattsville's City Council and take on new endeavors.

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Candace B. Hollingsworth  
Mayor, City of Hyattsville

November 19, 2018







## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Laura Reams

Submitting Department: Legislative

Item Type: Budget

Agenda Section: Consent Items (8:30 p.m. - 8:35 p.m.)

### SUBJECT

Disbursement of Ward 3 Discretionary Funds

### HCC-157-FY19

#### Recommendation:

I move that the Mayor and Council approve the disbursement of Ward 3 Council Discretionary Funds as follows:

- a) \$100 for the Hyattsville Police Department's 15th Annual Shop with a Cop event.
- b) \$250 towards the purchase of Chromebooks for University Hills Elementary School

#### Sponsor(s):

Suiter

#### Co-Sponsor(s):

Wright

### ATTACHMENTS

#### Summary Background:

Shop with a Cop:

On Saturday, December 15, 2018, the Hyattsville Police Department is hosting the 15th Annual Shop with a Cop event. Administrators from local Hyattsville Elementary schools identify children who would benefit most from the event. Children receive \$100 gift cards to buy holiday gifts at the Mall at Prince George's Plaza, and a special police escort with sirens blaring. After shopping, the children and police officers share lunch at Northwestern High School and photos with Santa. Last year the Police Department served 57 children with this program. This year, they hope to sponsor 100 children. So far, the police department has already raised \$7,500 of their \$10,000 goal. This \$100 of Ward 3 Discretionary Funds will allow another child to participate in this program.

University Hills Elementary School:

University Park Elementary serves a number of Ward 3 children. The University Park Elementary School PTA has launched a campaign to raise \$10,000 to buy 30 chromebooks (and a storage cart) for the school. Many students do not have access to computers in their own homes; and using laptops at school is their only opportunity to access a computer. The chromebooks will be used by the students for research, for homework assignments, to complete virtual labs and create presentations. As of October 22, 2018, the PTA has raised almost \$2000 from the school community. In addition, they received a \$1500 grant from the College Park Foundation (where a number of students live).

A contribution of \$250 from the Ward 3 Discretionary Fund will help them reach their fundraising goal.

#### Next Steps:

N/A

#### Fiscal Impact:

\$350

**City Administrator Comments:**

Recommend Support

**Community Engagement:**

N/A

**Strategic Goals:**

Goal 3 – Promote a Safe and Vibrant Community

**Legal Review Required?**

N/A



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Katie Gerbes

Submitting Department: Community & Economic Development

Item Type: Planning & Development

Agenda Section: Action Items (8:35 p.m. - 9:15 p.m.)

### SUBJECT

Rhode Island Avenue Trolley Trail Extension (10 minutes)

### HCC-138-FY19

#### Recommendation:

I move that the City Council authorize the Mayor to submit correspondence on behalf of the City of Hyattsville to the Maryland Department of Transportation State Highway Administration relaying the following comments on the 30% Design Plans for the Rhode Island Avenue Trolley Trail extension:

1. Generally speaking, supportive of the project, including the road diet, and look forward to its completion;
2. The City supports SHA's design to eliminate the U-turn lane at 42nd Place;
3. The City supports SHA's design to extend the stacking capacity of Rhode Island Avenue at Crittenden Street;
4. The City is recommending a buffer between the bus loading/unloading area and the trail;
5. There are concerns that a 'No Left' turn for northbound vehicles at 43rd Place will have significant negative impact on motorists behavior and will create significant additional vehicle trips on adjacent City roadways. The City is conducting a traffic count at the intersection to determine the traffic count at this location. Prior to proceeding with a design that would include a 'No Left Turn' for northbound traffic at 43rd Place, SHA shall confirm the turning radius, width of the median area and provide the City with a way-finding signage plan.
6. SHA should remove the mid-block crosswalk currently located at the County Services Building and replace it with a crosswalk at the intersection of Rhode Island Avenue and 43rd Place;
7. The City has concerns regarding the lack of adequate line-of-sight for westbound vehicles on Charles Armentrout Drive approaching Rhode Island Avenue. The City requests that SHA perform a site assessment prior to introducing into the design a north crosswalk at the Charles Armentrout/Rhode Island Avenue intersection;
8. The City recommends that the next set of plans needs to incorporate an expanded queuing area for pedestrians/cyclists at the intersection of Rhode Island Avenue and Charles Armentrout Drive;
9. Crosswalks should be incorporated at intersections throughout the project site, they shall be well marked and signalized to the extent feasible by SHA. If a signal or beacon is not feasible, standalone crosswalks are to be striped, reflective and highly visible to motorists;
10. The City recommends the incorporation of overhead lighting into this segment of the trail.

#### Sponsor(s):

At the Request of the City Administrator

#### Co-Sponsor(s):

N/A

#### ATTACHMENTS

[Trolley Trail 30% Design Action Memo.docx](#)

[Planning Committee Minutes - 10.16.18.docx](#)

[Rhode Island Trolley Trail Presentation.pdf](#)

**Summary Background:**

The Rhode Island Avenue Trolley Trail (RIATT) Extension Project is currently being performed by Maryland Department of Transportation State Highway Administration (SHA) to create a shared use path for pedestrians and cyclists that connect the Trolley Trail at its current terminus at Farragut Street to the Anacostia Tributary Trails System at Charles Armentrout Drive. The primary goal of the project is to provide connectivity to the existing trail systems and neighboring communities. Staff has reviewed the 30% design drawings and made several recommendations for the City Council to consider for submission to SHA regarding the 30% design plans.

**Next Steps:**

The City Council's comments on the design will be transmitted to SHA to take into consideration as they move forward into the next step of project design.

**Fiscal Impact:**

TBD

**City Administrator Comments:**

Recommend Support

**Community Engagement:**

SHA presented the 30% design plans to the City Council on October 1, 2018, as well as at the Planning Committee meeting on October 16, 2018. Before the close of 2018, SHA anticipates an additional public meeting to take place in Hyattsville. The date of that meeting is to be determined.

**Strategic Goals:**

Goal 3 – Promote a Safe and Vibrant Community

**Legal Review Required?**

N/A



# Memo

To: Mayor and Council

From: Jim Chandler, Assistant City Administrator and Director, Community & Economic Development  
Katie Gerbes, City Planner

Date: November 13, 2018

Re: Rhode Island Avenue Trolley Trail Extension – 30% Design

Attachments: 30% Design Drawings  
October Planning Committee Minutes  
Staff Recommendation Map

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The purpose of this memorandum is to provide the Mayor and members of the City Council with an update on the Rhode Island Avenue Trolley Trail Extension Project's 30% design, as presented by the Maryland Department of Transportation State Highway Administration (SHA) on October 1, 2018. Further, the designs were discussed at the Planning Committee meeting on October 16, 2018, which also served as a community meeting on the project.

- Maryland Department of Transportation State Highway Administration (SHA) has provided the City of Hyattsville and M-NCPPC with 30% design of the Rhode Island Avenue Trolley Trail (RIATT) Extension Project.
- The project is proposed to include a shared use path for pedestrians and cyclists that connect the Trolley Trail at its current terminus at Farragut Street to the Anacostia Tributary Trails System at Charles Armentrout Drive
- Maryland SHA presented the 30% design at the October 2018 Planning Committee meeting.
- Staff is providing the City Council with recommendations to submit to Maryland SHA for the agency's to consider incorporating into the project design and are included on page 3 of this memorandum.
- In order to maintain the project design schedule, it is necessary for the City Council to adopt recommendations to be submitted to Maryland SHA on, or by, November 19, 2018.

## Project Details

The Rhode Island Avenue Trolley Trail (RIATT) Extension Project is project currently being performed by Maryland Department of Transportation State Highway Administration (SHA) to create a shared use path for pedestrians and cyclists that connect the Trolley Trail at its current terminus at Farragut Street to the Anacostia Tributary Trails System at Charles Armentrout Drive. According to SHA, the primary goal of the project is to provide connectivity amongst the existing trail systems and neighboring communities.

The project scope includes a 10-foot-wide shared use path to connect the two existing trail systems. To accommodate the path, SHA is proposing a road diet on the northbound side of the road, north of Charles Armentrout Drive. Currently, Rhode Island Avenue at Charles Armentrout Drive provides for two vehicle lanes northbound until it reduces into one vehicle lane approaching Farragut Street. The RIATT 30% design is proposed to eliminate one traffic lane at Charles Armentrout Drive and repurposing the eliminated lane into the shared use path. SHA has studied the impact of the elimination of one lane, assessed 2040 transportation projections and have concluded that it will not have a significant impact on the flow of traffic or level of service for the intersection. There is a proposed grass buffer between the trail and the roadway along most of the path.

The northbound lane of Rhode Island Avenue south of the Charles Armentrout Drive intersection will be restriped so that there will be one left turn lane, one through lane and one right turn lane. Similarly, Charles Armentrout will be resurfaced so there is one lane for left and through traffic and one dedicated right turn lane. Both right turn lanes will be signed to be no right turn on red.

In addition to the path itself, the project will also add sidewalk to the southbound side of Rhode Island Avenue from Braxton Place to 41<sup>st</sup> Place. There is currently no sidewalk in that area. To accommodate the addition of this sidewalk, the shoulder on the right side of southbound Rhode Island Avenue will be reduced. Owners of the adjacent properties have been notified of this process and will be consulted as the plans progress. The new sidewalk sections will be Americans with Disabilities Act compliant.

On the northbound side of Rhode Island Avenue one bus stop will be removed, and two others will remain. Bus turnouts will be located at the two continuing bus stops to allow passengers to alight without causing a backup of traffic. As currently designed, there is no waiting or respite area for bus passengers other than the shared use path. As a result, passengers will be waiting and alighting onto the path itself.

Throughout the corridor, SHA is proposing several turning restrictions or lane modifications. These changes include increasing the storage capacity for cars turning left onto Crittenden Street from Rhode Island Avenue; restricting left turns onto Rhode Island Avenue from 43<sup>rd</sup> Place and restricting U-turns and eliminating the left turn lane on southbound Rhode Island Avenue at 42<sup>nd</sup> Place.

Despite the best efforts of SHA to avoid it, right-of-way will need to be acquired from CSX in order to facilitate this design. Land is needed from CSX south of the intersection of Rhode Island Avenue and Charles Armentrout Drive in order to accommodate the stormwater management facilities associated with this development. It is also possible that right-of-way may be needed on along Rhode Island Avenue north of Charles Armentrout in order to accommodate buffers between the road and the trail. The extent of the right-of-way needs has not yet been finalized, but is anticipated to be complete before the end of 2018. The project schedule moving forward is allocates one year to complete the right-of-way transaction. Any delay in the right-of-way entitlements could further delay the project.

The project was initiated in 2016, and August 2018 marked the completion of the 30% design of the trail. If the project design stays on schedule, it feasible for construction activities to commence in 2020.

#### Planning Committee Review

SHA presented their 30% design plans to the community at the October 16, 2018 Planning Committee meeting. The meeting was well attended, with approximately 30 guests, in addition to the 9 committee members. The Committee and guests had several questions for SHA representatives and made several dozen comments and recommendations to the project team. A summary of comments and recommendations are as follows:

- Supportive of this project and hope that SHA can accelerate the completion of the project to the greatest extent possible.
- Planning Committee recommends that the City Council do anything it can to help achieve right-of-way approvals from CSX.
- Support the road diet on Rhode Island Avenue necessary to facilitate this project.
- Support all of the aforementioned comments about crosswalk improvements listed on Page 6 of the meeting minutes.
- Support the idea that the Charles Armentrout and Rhode Island Avenue intersection needs to be carefully designed to ensure there is adequate crossing time for cyclists and pedestrians, that a crosswalk on the north side of the intersection is considered and that SHA look into ways to reduce the risk of injury as a result of blind turns and small queueing areas.
- Support the necessity of a study to look at the ripple effects of restricting the left turn onto Rhode Island Avenue from 43<sup>rd</sup> Avenue and the impacts that restriction will have on the adjacent streets.
- Support investigation into other traffic calming measures that can be taken on Rhode Island Avenue to slow the flow of traffic.
- Adequate lighting, supported and taken into the system by Pepco, is needed on this extension.
- Support the concept of incorporating branding opportunities into the plan and this segment of the trail as possible.
- Support the need for revisions to the plan to incorporate larger bicycle/pedestrian queueing areas at intersections, particularly at the intersection of Rhode Island Avenue and Charles Armentrout Drive.

Though the adopted recommendations by the Planning Committee are listed above, Staff highly recommends that members of the City Council review the meeting minutes to see the full list of questions and comments posed by the community. Meeting minutes from the October meeting are attached.

#### Staff Recommendations

Community and Economic Development and Department of Public Works staff have met to review the comments from the community meeting, as well as the design drawings provided by SHA. After reviewing the plans and public comment, Staff are recommending that the following feedback be relayed to the State Highway Administration:

1. Generally speaking, supportive of the project, including the road diet, and look forward to its completion;
2. Staff support SHA's design to eliminate the U-turn lane at 42<sup>nd</sup> Place. See label "4" on map;

3. Staff support SHA's design to extend the stacking capacity of Rhode Island Avenue at Crittenden Street. See label "5" on map;
4. A buffer is needed between the bus loading/unloading area and the trail itself. As currently designed, passengers waiting to board the bus have no dedicated waiting area. Instead, they will be forced to stand on the trail until a bus arrives, creating a conflict point between cyclists and pedestrians. Staff believes that a buffer is needed to provide an appropriate space out of the flow of trail traffic for bus riders to wait. Staff would prefer if the additional right-of-way was purchased from CSX that would allow the trail to shift slightly to the east, creating a landing space for bus riders. If that option is not feasible, Staff believe that the width of the trail should be reduced at these points in order to create a landing area. See labels "2A" and "2B" on map;
5. Staff is concerned that a 'No Left' turn for northbound vehicles at 43<sup>rd</sup> Place will have significant negative impact on motorists behavior and will create significant additional vehicle trips on adjacent City roadways. Staff would like confirmation from SHA on the median proposed on Rhode Island Avenue north of the intersection with 43<sup>rd</sup> Place. The SHA presentation provided to the community showed that the median will be removed, but the construction drawings indicate that a median will be added. Prior to adopting a position on the proposed left turn restriction from 43<sup>rd</sup> Avenue, Staff recommends that SHA confirm the proposed geometry of the roadway in this area. See label "3" on map;
6. SHA should remove the mid-block crosswalk currently located at the County Services Building and replace it with a crosswalk at the intersection of Rhode Island Avenue and 43<sup>rd</sup> Place. The existing crossing is duplicative of the signalized crossing at Farragut Street and has limited usage due to the vacancies in the County Services Building. A crosswalk at 43<sup>rd</sup> Place would provide direct access to the adjacent commercial uses and is the intersection location is more consistent with acceptable pedestrian standards. See label "1" on map;
7. Staff does not recommend the installation at the northern edge of the intersection of Rhode Island Avenue and Charles Armentrout Drive. While it could improve walkability, Staff believe that the existing southern crossing, if widened, as proposed by the 30% drawings, is sufficient to provide cyclists and pedestrians with an east-to-west crossing of Rhode Island Avenue. The northern edge of the intersection has a very limited line of sight from vehicles turning onto Rhode Island Avenue from Charles Armentrout Drive and believe that a crosswalk in this location could create conflicts with vehicles and pedestrians or cyclists. See label "6" on map;
8. Staff recommends that the next set of plans needs to incorporate an expanded queuing area for pedestrians/cyclists at the intersection of Rhode Island Avenue and Charles Armentrout Drive. It is anticipated that this intersection will see a significant increase in non-motorized vehicle traffic and there needs to be assurance that there is sufficient waiting space for those that need to cross Rhode Island Avenue. See label "7" on map;
9. Crosswalks should incorporated at intersections throughout the project site, they shall be well marked and signalized to the extent feasible by SHA. If a signal or beacon is not feasible, standalone crosswalks are to striped, reflective and highly visible to motorists;
10. Staff recommends the incorporation of overhead lighting into this segment of the trail.



## Next Steps

Staff feedback on the project will be presented to the City Council during the “Action” agenda on November 19, 2018 City Council meeting. The action requested of the City Council is a list of comments to provide SHA as they move into the next phase of project design.

CITY OF HYATTSVILLE  
PLANNING COMMITTEE MINUTES  
OCTOBER 16, 2018

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- Introduction of Committee & Guests Members (7:37 PM)
  - o Maureen Foster
  - o Wil Maxwell
  - o Todd Dengel
  - o Jonathan Mueller
  - o David Marshall
  - o Nkosi Yearwood
  - o Thomas Sheffer
  - o Tom Wright
  - o Jim Chandler
  - o Katie Gerbes
  - o Michael Baird, State Highway Administration
  - o Kidus Debasu, State Highway Administration
  - o Simon Chacha, State Highway Administration
  - o Sam Deres, Resident
  - o Jeff Lemieux, Resident
  - o Yohannes Bennehoff, Resident
  - o Brian Suhoem, Delegate Alonzo Washington's Office
  - o Garrett Hennigan, WABA
  - o Rumi Matsuyama, Resident
  - o Flawn Williams, Resident
  - o CJ Militello, Resident
  - o Chris Davidson, Resident
  - o Christy Reganhardy, Resident
  - o Ken Carter, Resident
  - o Heather Olson, Resident
  - o Laurie Lemieux, WABA/Proteus Bikes
  - o Scott Wilson, Resident
  - o Ben Simasek, Resident
  - o Delegate Anne Healy, District 22 Delegate & Resident
  - o Jeff Clark, Brentwood Resident
  - o James Hellic
- Committee Business (9:10 PM)
  - o Adoption of Minutes from September 2018
    - Adopted with edits
  - o Several committee members have terms expiring at the end of the year, so you will soon be receiving an email with directions to reapply. If you do not any to renew your term, let Jim or Katie know so we can fill the seat.

- Rhode Island Avenue Trolley Trail Extension (7:37 PM)
  - o Proposed 10-foot shared use path that will connect the Anacostia Tributary Trails System and the Rhode Island Avenue Trolley Trail
    - Will also be constructing an ADA compliant sidewalk on the southbound side of Rhode Island Avenue from Crittenden down to Charles Armentrout where there is currently no sidewalk
  - o Project Milestones:
    - Requested by the City of Hyattsville in 2016
    - Design initiation in August 2017
    - Right of Way needs in December 2018
    - Right of Way cleared and construction start in Spring 2020
  - o There are currently five bus stops along the route, but one is proposed to be removed due to low passenger usage and a nearby stop served by the same bus routes
  - o Project proposed a road diet on northbound Rhode Island Avenue in order to accommodate the trail extension. Rhode Island Avenue northbound will be one lane only from Charles Armentrout to Farragut Street (where it currently merges into one lane)
    - Traffic analysis has shown that this change will not impact the level of service of the road
  - o There will be two bus turnouts on northbound Rhode Island Avenue to get the buses off of the street to reduce backup
  - o Will be reducing median north of 43<sup>rd</sup> Avenue to reduce a pinch point for stalled vehicles
    - Also proposing restricting left turns from 43<sup>rd</sup> Avenue onto Rhode Island Avenue for safety reasons
  - o Need to acquire significant right-of-way on the northbound side of the road, and temporary right-of-access easements necessary on the southbound side to construct the sidewalk
  - o A mandatory referral meeting with City of Hyattsville and M-NCPPC will be held before the end of the year
  - o Clarifying questions:
    - o You said you will no longer allow left turns from 43<sup>rd</sup> Avenue to Route 1. Where will those cars go?
      - They can make a right onto US-1 and then make a U-turn to go north or use the signalized intersection at Farragut Street.
    - o Can you talk about the road diet a little bit?
      - Repurposing the right-most lane of northbound traffic to construct the trail. With the road diet and new path, our studies show there will be no significant change in traffic operations. It will become a one lane at Charles Armentrout instead of at Farragut Street.
    - o Are there any sort of precautionary bollards or anything buffering the trail?
      - There will be a grass buffer.

- Will be increasing the storage area for left turns onto Crittenden Street or 42<sup>nd</sup> Place.
- o What is the critical length volume standard?
  - Not sure.
- o Was there a certain growth factor taken into consideration here for future conditions?
  - We are using level of service calculations. We don't have the numbers right now but can provide them to the City.
- o The main reason for this is to connect the trail from Franklin's to the Anacostia Trail, right?
  - That is the express purpose.
  - One of the issues is the adjacent CSX right-of-way. If we need to take their land, this project can be stalled for years. The alternative we have here is to take a part of the road to accommodate the trail and ensure it gets completed.
- o We're these the only two times you looked at traffic counts? Is there any time taken around 5 PM?
  - Yes, we look at range of peak hours.
- o What is the lighting plan for the path? I don't think there is lighting right now.
  - Looking into the design of that, but haven't reached that point yet as we are only at 30% design.
- o The buffer seems to be about 5 feet. Does that change at the bus stop?
  - Where there are bus stops, the buffer will be reduced to zero, so there will be no grass in front of the bus stop.
- o The 2040 PM has it goes from an E to and F, then optimized it comes back to an E. Does that mean it is not currently optimized? What about it will bring it back up? How do you optimize and why aren't we doing it now?
  - We look at the level of service and gauge the condition and optimization all the time. It is not that we don't do it, we are always doing it.
  - How far up Route 1 do we have to optimize to make these changes? How large of an area is affected?
    - The main issue is at Charles Armentrout, so all of the optimization's will be there.
- o The crosswalk at Charles Armentrout will be on the south side or the north side to access the trail? Currently the crosswalk is on the south side of the intersection.
  - The current crosswalk will be widened and pushed back slightly. There will be a north/south crosswalk on the west side of Rhode Island Avenue.
- o At the bus stop you said the buffer goes down to zero buffer. Where do passengers get on/off the bus?
  - There is an open space for them to step onto.
    - Is the open space the shared use path?
      - o Yes.

- We are working to see if we can acquire CSX right of way to build in a landing area.
- o On the traffic analysis, was a lower stress route for cycling taken into account?
  - No, the traffic numbers were done for the corridor as a whole in advance of this analysis.
- o Northbound automotive traffic from Charles Armentrout has two lanes reducing to one. Will one of those lanes have a priority or will it be an alternate merge?
  - Right most lane will be a dedicated right turn only, and the center lane will be through traffic only south of the Armentrout intersection.
- o The timeline does not seem correct. We tried to get this project going in 2008. When you come up to Route 1 from Armentrout, what is the time of the pedestrian crossing? It is currently 14 seconds and that is not enough time.
- o On 43<sup>rd</sup> where you make it no left turn, has there been any study on how that will impact the traffic of the neighborhood.
  - There is currently a huge traffic conflict by turning, so we want to make it safer by removing.
- o Has there been any study about the negative impact of businesses on the corridor with the project not starting until 2020. Has there been a study looking at the negative impacts of this not happening sooner?
  - There has not.
- o Where are the pinch points between CSX and the existing right-of-way?
  - There was a pinch point by 42<sup>nd</sup> Place where we needed to put our storm water management facilities, but we've redesigned to ensure we don't cross that line.
- o Will there be squared off corners to discourage right turns and will right turns on red be prohibitive at Charles Armentrout?
  - Yes, and we are looking to install bike/ped specific lights.
- o The sidewalk on the southbound side looks like you are hoping to put it where the current road shoulder is. Is that correct?
  - Yes.
- o Going southbound on Route 1, is there a way to do a little bit of traffic calming as well?
  - The road diet should accomplish that.
- o I am finding it hard to understand a lot of these maps because they don't have legends and are very technical. Is it possible to have a version of this presentation available to where it is legible to those who are not traffic engineers?
  - Is it possible to get a blow up of these maps with better keys and legends? Is there a way to improve the presentation to make it more clear?
  - We can provide you with some public displays.

- o Is it possible to have a meeting where people meet on-site to talk about this?
  - It has happened in the past, we could possibly arrange something similar to this on site, but it would likely have to be in the daytime or in the spring when it gets darker later in the day.
- o Are there going to be any traffic calming measures at the intersection with Armentrout?
  - The right most lane will turn into right turn only both going northbound on Route 1 and from Charles Armentrout. There will also be an activated pedestrian signal which will help reduce conflicts.
- o Are the lanes narrower with this plan?
  - The lanes will be narrowed and there will be a curb adjacent to the right most side of the lane. It will seem a lot tighter when you remove the shoulder and have some narrow lanes. The footprint available for vehicles will be reduced and will be perceived as narrower.
- o Is the City or State studying the impact of restricting the left turn on 43<sup>rd</sup> on adjacent intersections. You might have to take Crittenden or Farragut. Has it been studied or will it be studied?
  - We will add to list of comments.
- o Are there similar improvements proposed for other crossings of Route 1 as there are at Armentrout?
  - So far, we have not done anything to the other crosswalks.
- o In terms of consultation with CSX, what is the status of those discussions?
  - We are trying to contact the correct person at CSX. Right-of-way acquisition has not been discussed yet.
  - M-NCPPC has stated they would be willing to pick up acquisition costs through the program open space project.
- Comments from Committee & Guests:
  - o General Comments:
    - It is important that the physical barriers and buffers are sufficient, because cars have driven through many of the buildings in this area, so that could do significant damage to a cyclist. Separation of the trail from the roadway but also to protect the buildings in the area. Buffer is especially important at the bus turnouts
    - There is a need for traffic calming on southbound Route 1 after Crittenden Street.
    - What is the timing of some of these looking at feedback you are getting?
      - Within the next 30 days.
    - When you come back, it will be helpful to know what standards you are using.
    - From the cyclist community, if there is some compromise that needs to be made because of issues with CSX, I think the community will be pleased to get the best we can get, even if the trail is narrower than 10 feet, to make this happen.

- Important to keep up the public conversation throughout this process.
- There are areas with extra right of way which are good ideas for trail identity and branding.
- What is the speed limit going to be in this area?
  - Currently 25 miles per hour.
- Is there anything legally preventing you from going to 10-foot lanes?
  - It is too narrow.
  - Suggest that 10-foot lanes could be used here.
- Would like to see no right turn on red off of Armentrout onto Route 1
- Consider 10-foot lanes to calm traffic.
- Tell us what we can do and how public support will best accelerate this process.
- Where you are creating a wetland and the median in the middle are great opportunities for plantings or branding to beautify the project.
- Heading into North Brentwood, perhaps make a gap in the guardrail so people can access that trail from Rhode Island Avenue
- Lighting on the trail would be great to increase visibility
- o Crosswalks/Sidewalks:
  - Need to look at improvements to all of the crosswalks in the corridor, as there will be increased pedestrian and bicycle demand to those crosswalks when this project is completed, so make sure those are accommodated.
  - Look at optimizing location of the crosswalks in the area – there may be better places for crosswalks.
  - Need to look at the crosswalk timing to the intersection of Farragut Street and Route 1, as well as Charles Armentrout and Route 1 to ensure there is enough time to cross.
  - I notice that you have crosswalks at intersections that are not signalized. Pedestrians will not be comfortable crossing in areas where there are not signals and cars do not stop here. I hope you find a way to eliminate them, as they are a safety standard.
  - Need a crosswalk crossing Route 1 at Armentrout on the north side of the intersection.
  - Intersection at Farragut Street was rebuilt not too long ago, so it has ramps and marked sidewalks. The signal call buttons have not worked there for months, so maintenance there is lacking and necessary.
    - Another example of a blind intersection.
  - Support the striping of the crosswalks, but believe flashing yellow lights or stop signs/stop lights would also be great.
  - Is there a plan to link a sidewalk south of Armentrout? That would be helpful for those coming from the south.
- o CSX:
  - Could be a huge impediment to the implementation of this plan, so encourage to leverage elected officials and other residents to make that happen.
- o Charles Armentrout Intersection:

- Westbound on Armentrout there is a blind intersection because of the CSX overpass. Perhaps a large fisheye mirror that would allow better visual on that intersection for cyclists and vehicles.
  - Everywhere there is a crosswalk there needs to be adequate space for people to queue up, so they are not standing in the middle of the trail and blocking it. This is especially important at Armentrout. The more space we can give people to wait for the light, the more people who will wait to use that light. Larger queuing spaces are also more visible.
- o 43<sup>rd</sup> Avenue Left Turn Restriction:
  - Need to study if there is a ripple effect on other intersections as a result of this one no longer being able to be used to go northbound.
  - How will the no turn be enforced?
  - Would like to study the impact of this restriction on the neighborhood and nearby businesses.
  - By removing this intersection, we are asking cars to make a u-turn onto a road that has now been limited down to one lane which is dangerous.
  - Support terminating left turn on 43<sup>rd</sup>
- o Buffer:
  - Worried about conflicts with buses and trail – the more buffer between the trail and moving traffic, even one foot, the better.
  - Wherever we can, we should minimize shoulder and maximize buffer.
  - There needs to be a physical barrier between the trail and traffic, especially in places where there is a limited buffer or potential conflict with vehicles. Having a curb there is not enough.
- Adopted Committee Recommendations:
  - o Supportive of this project and hope that SHA can accelerate the completion of the project to the greatest extent possible.
  - o Planning Committee recommends that the City Council do anything it can to help achieve right-of-way approvals from CSX.
  - o Support the road diet on Rhode Island Avenue necessary to facilitate this project.
  - o Support all of the aforementioned comments about crosswalk improvements listed on Page 6 of the meeting minutes.
  - o Support the idea that the Charles Armentrout and Rhode Island Avenue intersection needs to be carefully designed to ensure there is adequate crossing time for cyclists and pedestrians, that a crosswalk on the north side of the intersection is considered and that SHA look into ways to reduce the risk of injury as a result of blind turns and small queueing areas.
  - o Support the necessity of a study to look at the ripple effects of restricting the left turn onto Rhode Island Avenue from 43<sup>rd</sup> Avenue and the impacts that restriction will have on the adjacent streets.
  - o Support investigation into other traffic calming measures that can be taken on Rhode Island Avenue to slow the flow of traffic.
  - o Adequate lighting, supported and taken into the system by Pepco, is needed on this extension.
  - o Support the concept of incorporating branding opportunities into the plan and this segment of the trail as possible.



- o Support the need for revisions to the plan to incorporate larger bicycle/pedestrian queuing areas at intersections, particularly at the intersection of Rhode Island Avenue and Charles Armentrout Drive.
- Development Updates (9:13 PM)
  - o Landy:
    - Planning Board hearing will take place on Thursday. Roadways are public and will be dedicated to the City once the units are sold. Architectural DSP likely submitted in end 2018/early 2019.
  - o Armory Apartments:
    - Subdivision Review Committee scheduled for Friday. Will come back to the City Council for action in November.
    - There is a variance being requested for the public utility easement; staff support this request.
    - Their bike/pedestrian plan includes a Trolley Trail marker, crosswalk improvements and potentially a Capital Bikeshare station. Working with the applicant and County to solidify that.
    - The applicant may not be required to file a detailed site plan, but they have agreed to present it to the community anyways to get feedback.
  - o Magruder Pointe:
    - Applicant has requested that it be sent back to the Planning Board in order to file an additional ethics affidavit and ensure there is 2 weeks between the staff report issued and the Planning Board hearing.
  - o Riverfront at West Hyattsville:
    - Grading should conclude in November, at which point the infrastructure component will kick in.
  - o Economic Development Report is out for Fall 2018. Copies are available and the report will be posted on the City's website
  - o Transportation study is on Speak Up and comments will be accepted until October 29.
  - o Sustainability Plan will be receiving an award for "Outstanding Plan" from the National Capital Area Chapter of the American Planning Association on Thursday.
  - o Hyatt Park:
    - Waiting to get electric permits from Pepco to begin electric and ground work. Hoping to get electric installed before the ground freezes.
  - o DM: The former gas station on north end of EYA project – do you know what is going there?
    - Believe it is still up for lease without a tenant.
  - o MF: When will the commercial façade project for Dr. Lilly to be complete?
    - Before the end of the year. They told us 6 weeks of work.
  - o NY: What is happening on Hamilton Street? It is a very bumpy ride.
    - It is part of WSSC water main repair work. They will be required to replace, but will wait until the entire section is complete.
  - o MF: What is the latest with the townhouses on Oglethorpe?

- We have not heard anything. If the applicant does not meet a single standard, he will need a detailed site plan. We believe he is evaluating his options at this point.
    - DM: Could they put a multifamily on that site by right?
      - I believe so, but don't quote me.
  - o NY: Any update on the Ager Road project?
    - They have not put out a bid for construction.
  - o TD: Is the TESST building project still going on?
    - Yes, but has not started. We are waiting on formal award from the state in order to issue our local awards.
  - o MF: Had the community shred date been rescheduled?
    - Yes, but we don't have an exact date yet.
  - o TD: What is the timing on the police station and the next steps for this building?
    - The engineering design will be approved in January 2019, at which point we will go to bid for a construction contract. Construction time is approximately 13 months. We are planning to have them in the building by April 2020, on a conservative timeline.
    - Nothing will happen on this building until the police building and the new DPW site are financed and know what our debt service looks like.
  - o MF: The new electric signs look nice.
- Adjourn (9:48 PM)



# RHODE ISLAND TROLLEY TRAIL

From Charles Armentrout Dr to Farragut St



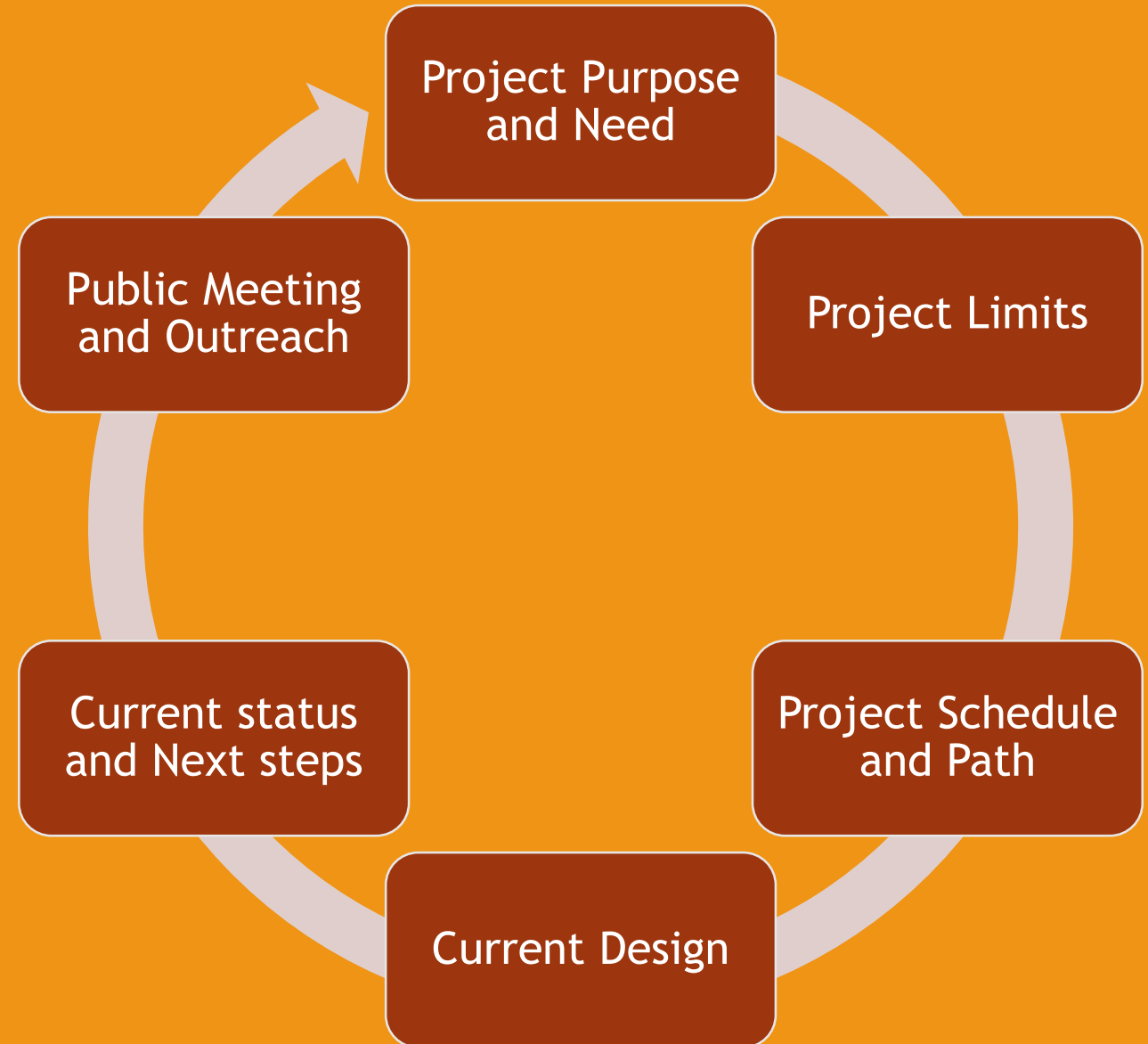
Kidus Debasu

Transportation Engineer, Office of Highway Development

MDOT State Highway Administration

[Kdebasu@sha.state.md.us](mailto:Kdebasu@sha.state.md.us)

# Topics

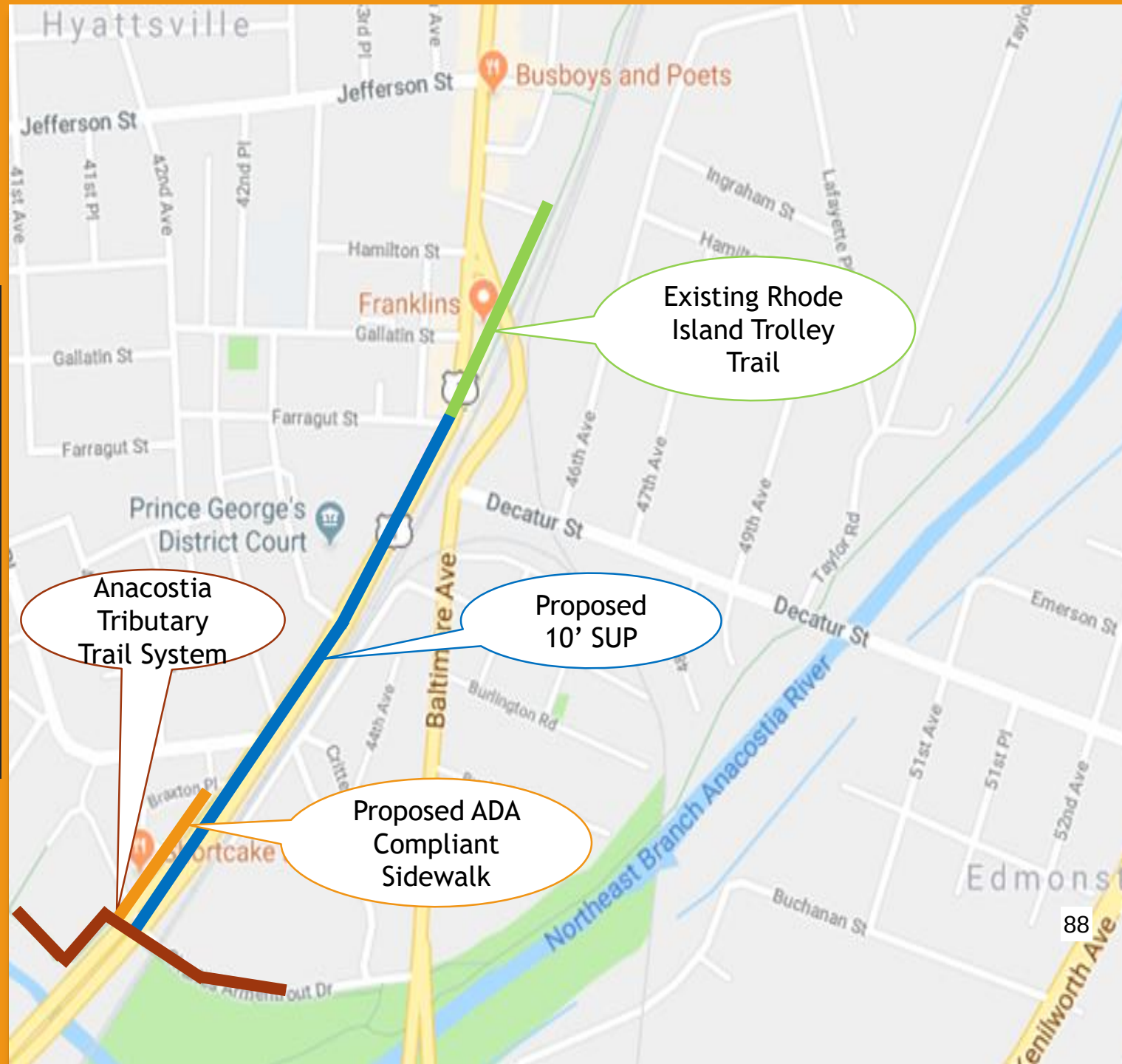




# Purpose and Need

- The project aims to construct a shared use path for both pedestrians and bicyclist that connects to two trails namely, the Existing Rhode Island Trolley Trail and the Anacostia Tributary Trail system.
- While the primary aim of this project is to improve the connectivity amongst the existing trail systems it will also further enhance connectivity between neighboring towns.

# Project Limits

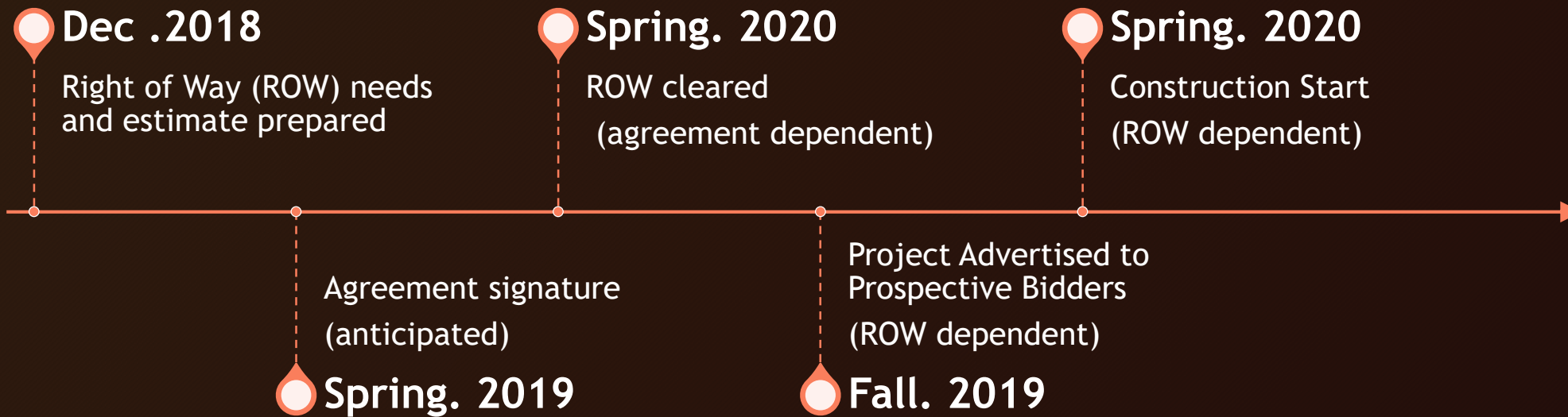




# Milestones to Date



# Project Schedule





# Existing Condition

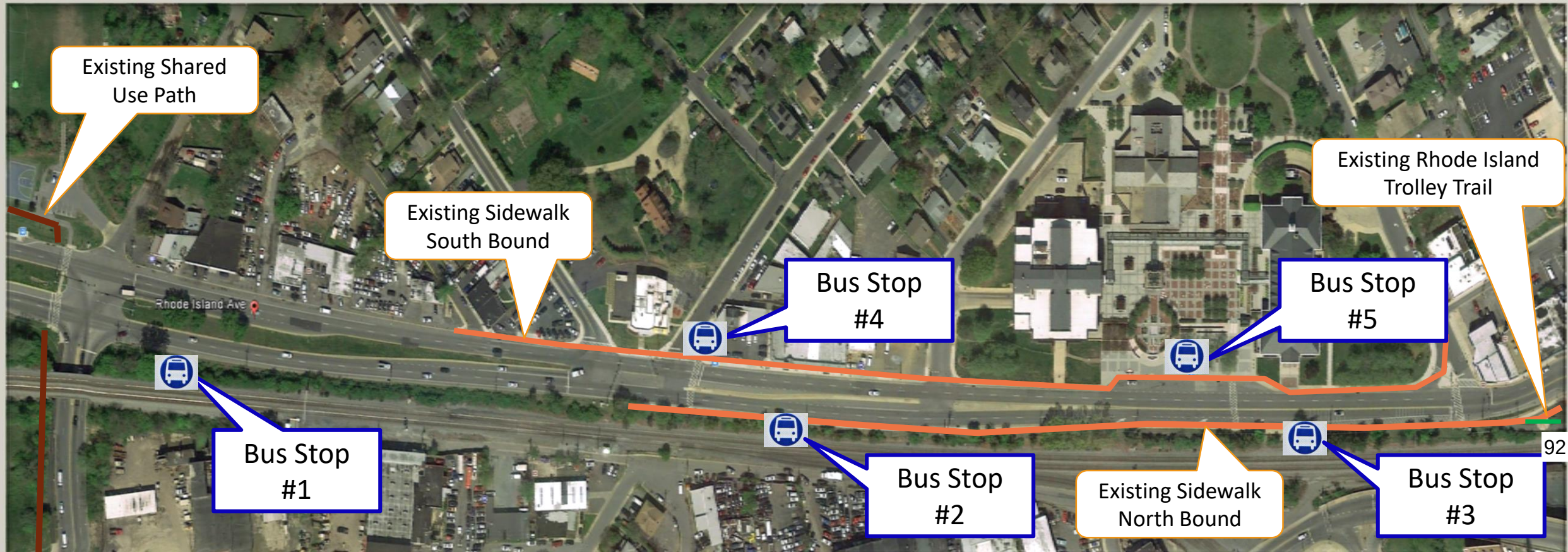
## Existing Condition :-

- 4-Lane high way, two lanes on each direction.
- Intersection of Charles Armentrout Dr with Rhode Island Ave
- Adjacent to North Bound lane is the CSX trainline.



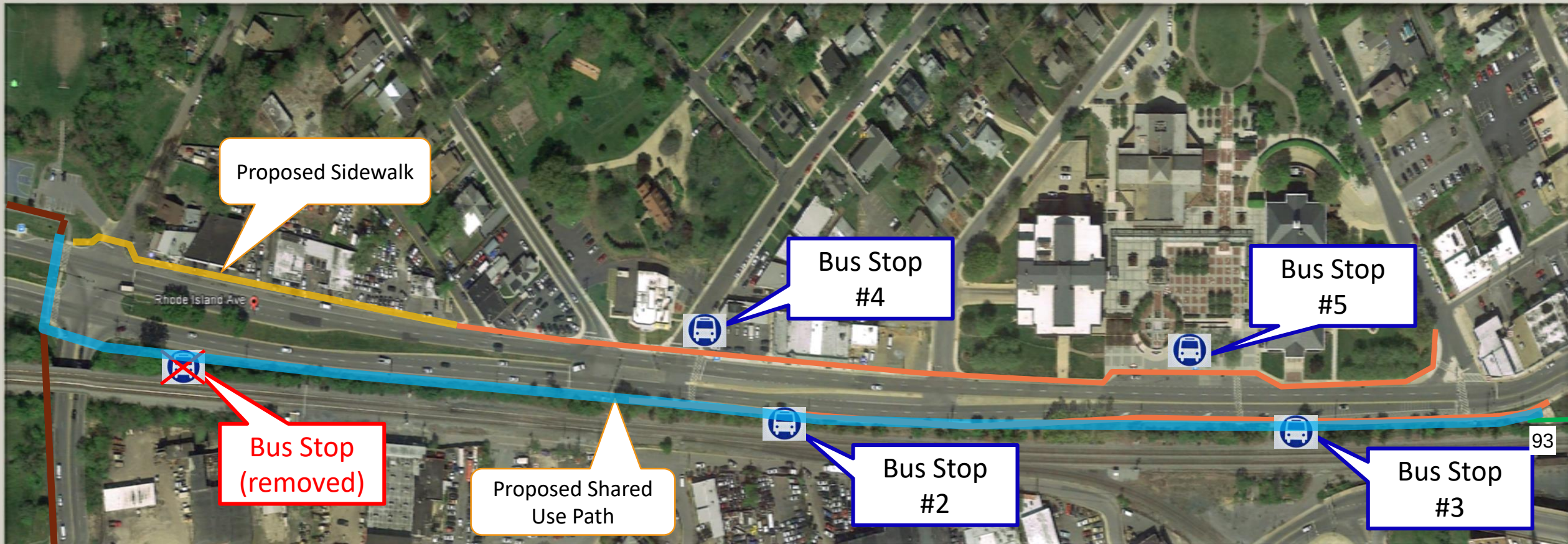


# Existing Bicycle and Pedestrian Facilities





# Proposed Bicycle and Pedestrian Facilities

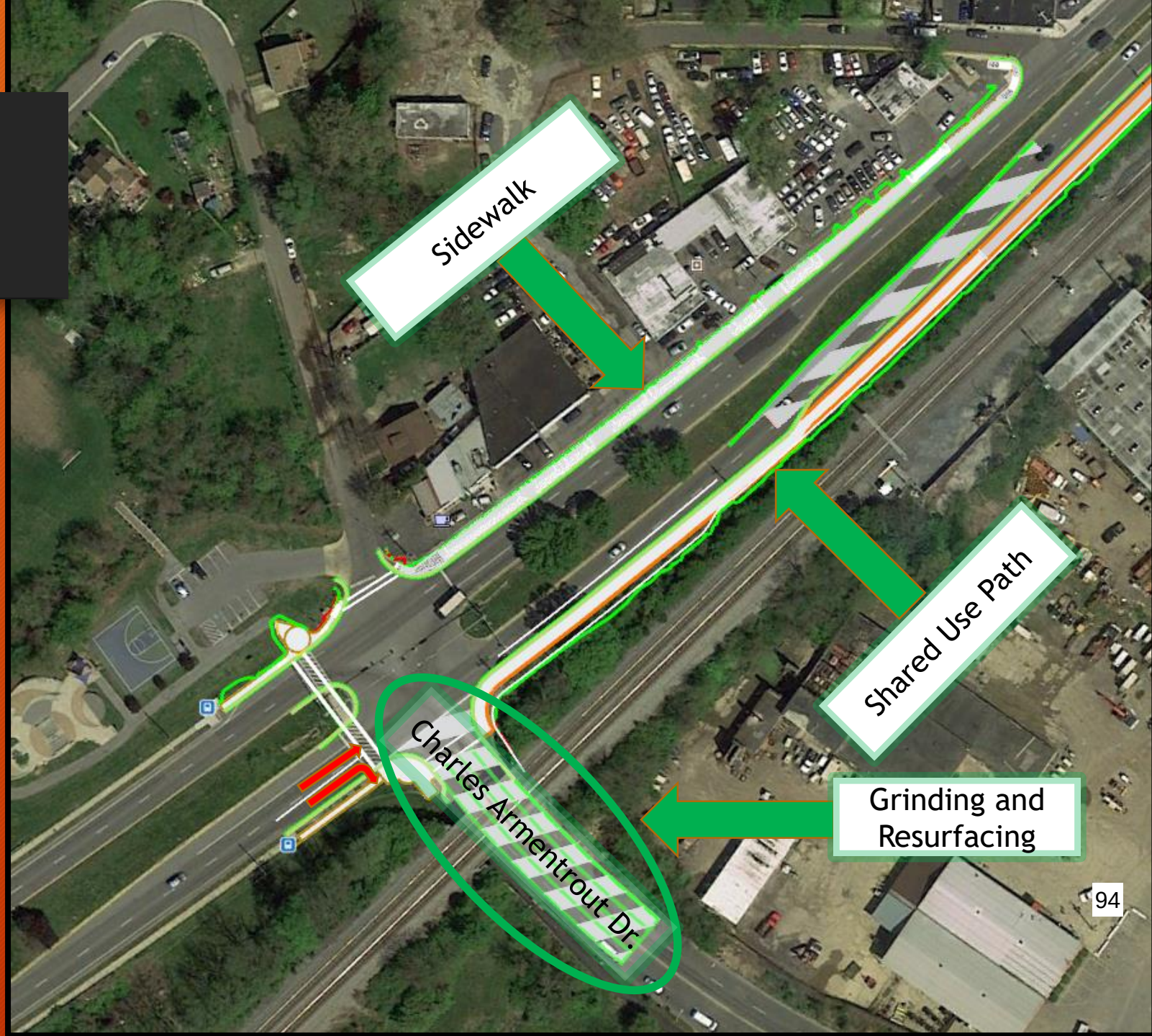




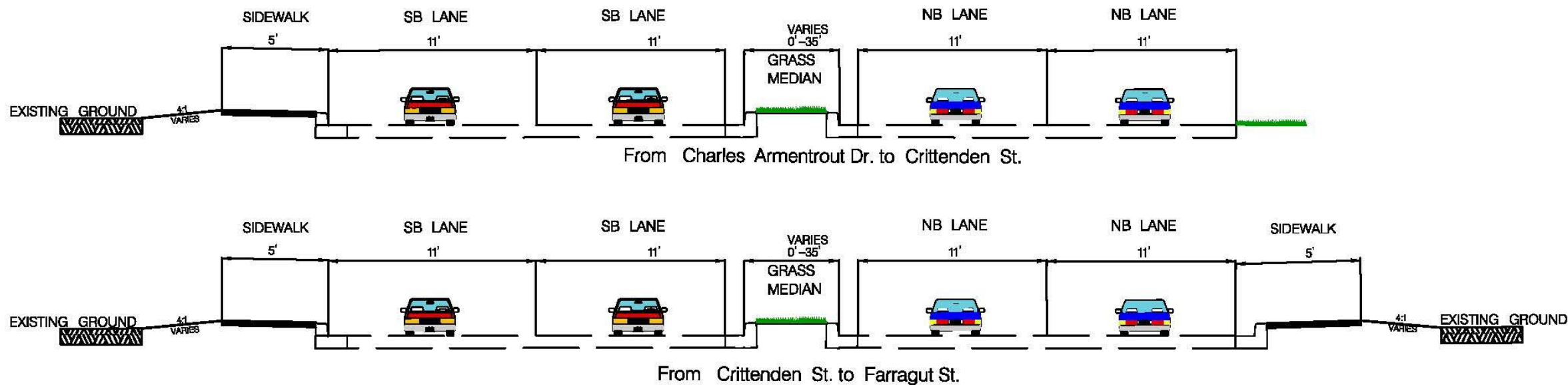
# Current Design

- Proposed:-

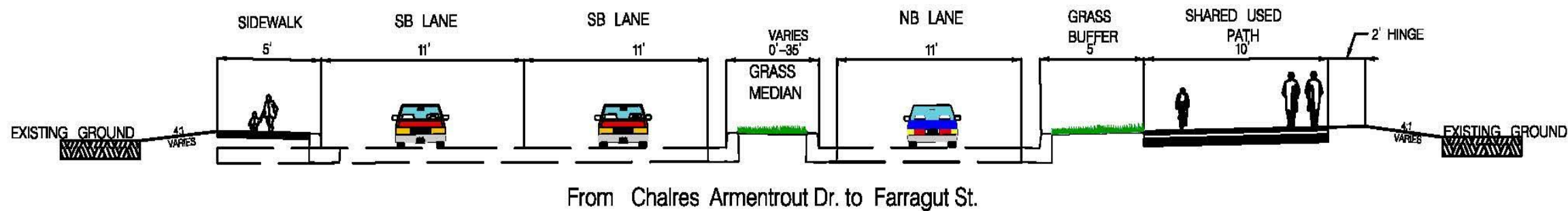
- Resurfacing on Charles Armentrout Dr. to increase separation between vehicular traffic and the existing Shared Use Path.
- Construct a Shared Use Path from Charles Armentrout to Farragut Street NB side.
- Construct ADA Compliant Sidewalk from 41st St. up until Braxton Pl.
- A road diet on US 1 is proposed to accommodate these improvements.







# Existing Typical Section

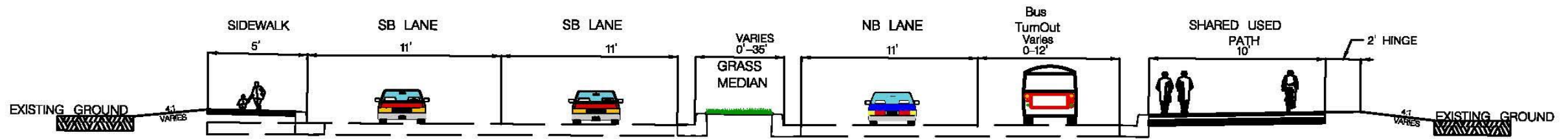


## Proposed Design Typical Section (Road Diet)

# Traffic Analysis

- Road Diet Analysis
- Traffic analysis was completed by MDOT SHA.
- Traffic analysis numbers predict future traffic conditions with a road diet will be comparable to the existing traffic condition.
- Traffic signals will be optimized throughout the corridor to minimize exasperating vehicular traffic operations.

| Intersection                                            | 2040 AM   |           | 2040 PM   |           |                       |
|---------------------------------------------------------|-----------|-----------|-----------|-----------|-----------------------|
|                                                         | No Build  | Road Diet | No Build  | Road Diet | Road Diet (Optimized) |
| US 1 at<br>41 <sup>st</sup> Pl/Charles<br>Armentrout Dr | E<br>66.6 | E<br>67.4 | E<br>74.1 | F<br>88.3 | E<br>77.5             |
| US 1 at<br>Crittenden St/<br>42 <sup>nd</sup> St        | B<br>13.9 | B<br>14.1 | C<br>32.4 | C<br>30   | C<br>28.2             |
| US 1 at<br>Farragut St                                  | A<br>3.8  | A<br>3.7  | A<br>6.7  | A<br>5.2  | A<br>4.9              |
| US 1 at<br>Gallatin St                                  | A<br>4.3  | A<br>4.2  | A<br>3.6  | A<br>3.6  | A<br>3                |



# Proposed Design Bus Turnouts

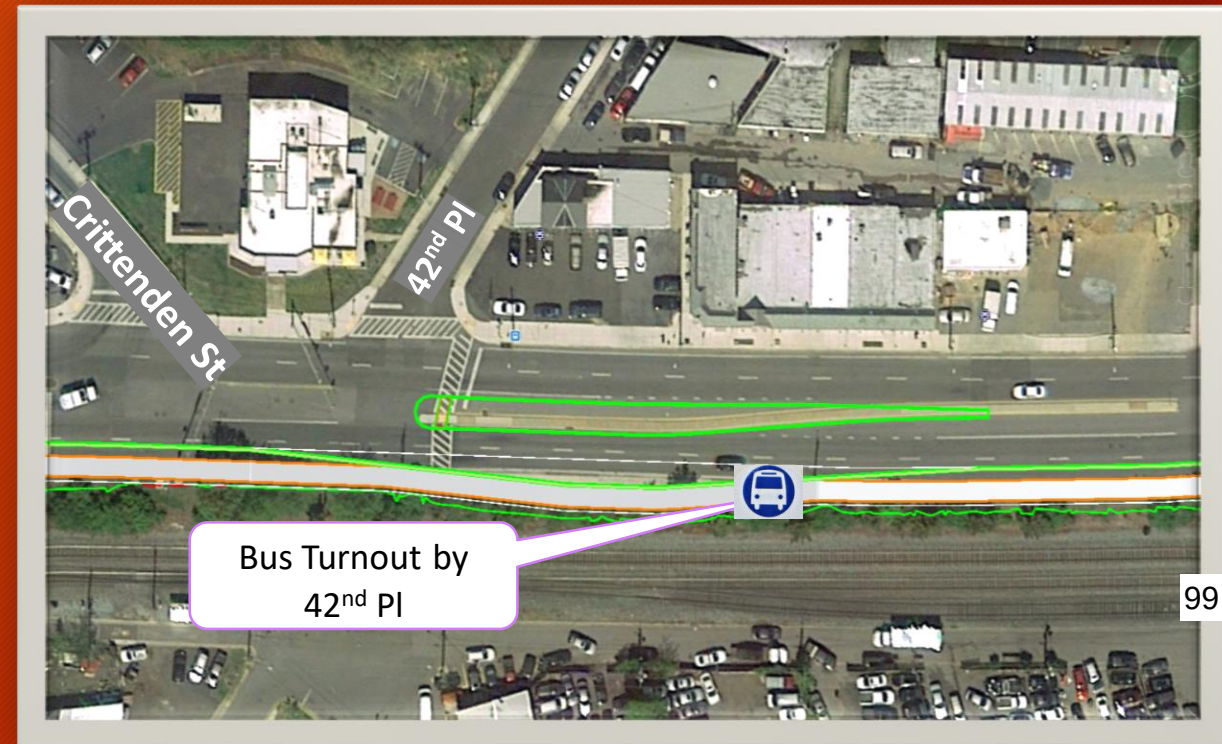


# Bus Turnout Design

Existing



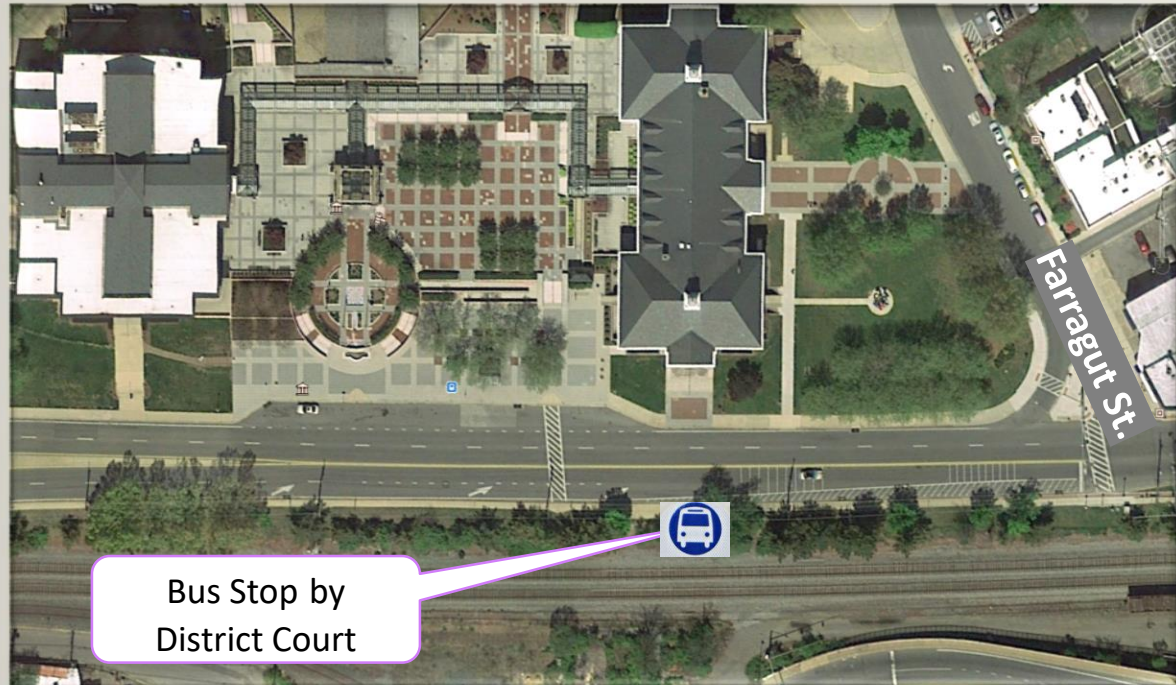
Proposed



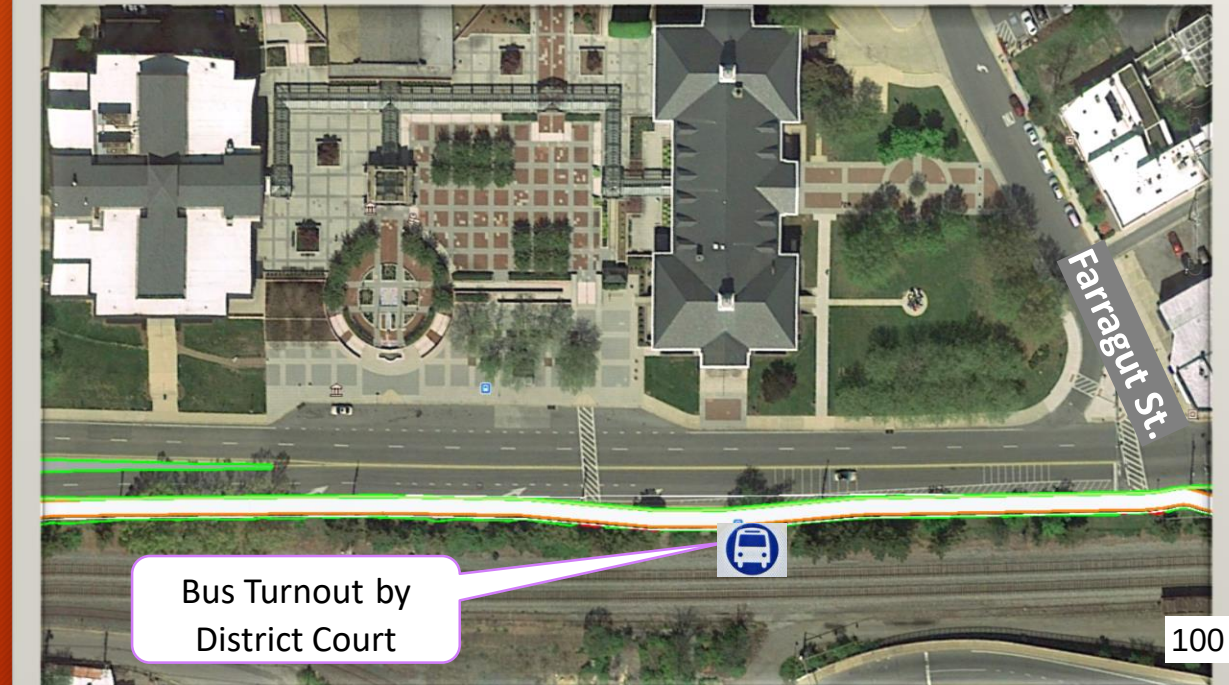


# Bus Turnout Design

Existing



Proposed





# Other Road Diet treatments

## Left turn lanes



- Increasing Storage on left turn onto Crittenden St.



# Other Road Diet treatments

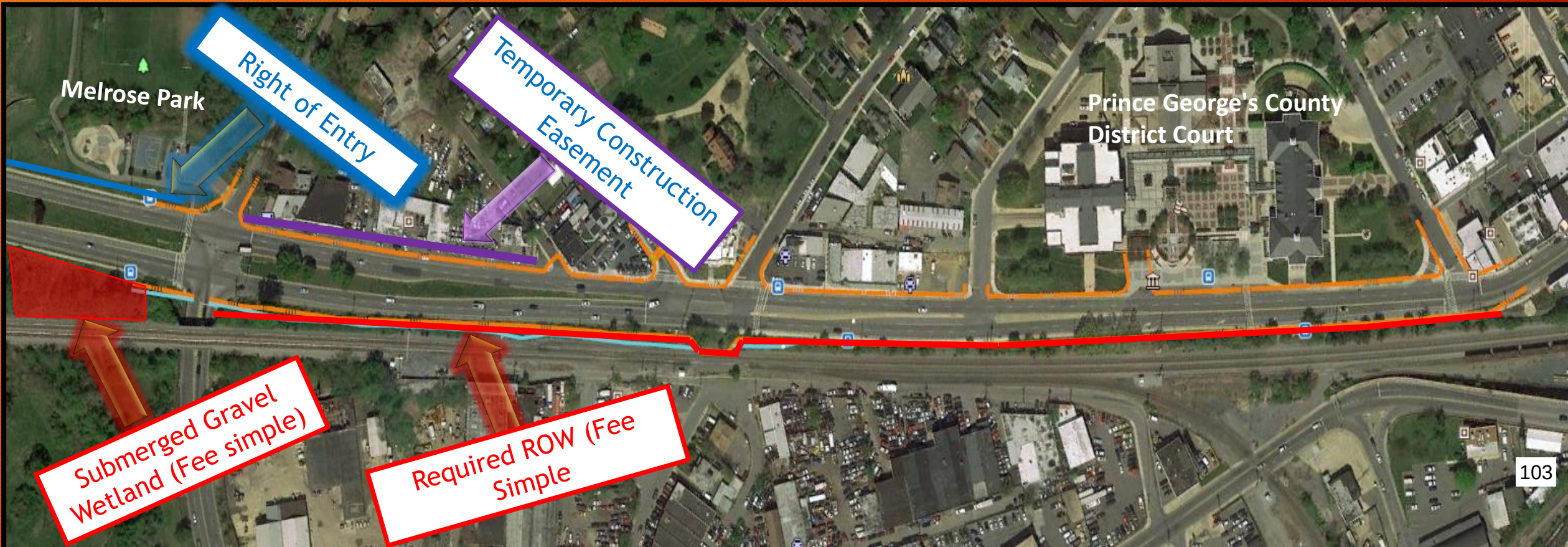
## Provisions for stalled vehicles



- Removing Median at US 1 north of 43<sup>rd</sup> Ave.
- Restricting Left Turn from 43<sup>rd</sup> Ave onto US 1.



# ROW (Right of Way) Information





# Current Status and Next Steps

- Design has reached 30% design completion.
- Additional Right of way (ROW) will be required for Storm Water Management.
- The extent of right of way need will be finalized after supplemental metes and bounds surveys are complete. Anticipated to be done by the end of October.
- Coordination with CSX transportation will be required to ensure smooth ROW transaction.
- Estimated construction date would be based on right of way.





# Public Meeting and Outreach



- A mandatory referral in partnership with the city of Hyattsville and M-NCPPC (Maryland-National Capital Park and Planning Commission) will be scheduled prior to the end of the year.
- A public meeting will be coordinated with City officials subsequent to the Mandatory referral.



# Need information /Have Questions

US 1 from Chapman Avenue to Farragut Street Bicycle Retrofit  
(Rhode Island Trolley Trail)

Kidus Debasu- MDOT SHA

Project Manager

Phone: 410-545-8824

Email: [Kdebasu@sha.state.md.us](mailto:Kdebasu@sha.state.md.us)

# Questions





## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Ordinance

Agenda Section: Action Items (8:35 p.m. - 9:15 p.m.)

### SUBJECT

Hyattsville Ordinance 2018-06, Repeal and Replace Chapter 8, Elections (10 minutes)

### HCC-150-FY19

#### Recommendation:

I move that the Mayor and Council introduce Hyattsville Ordinance 2018-06, an Ordinance whereby the City of Hyattsville repeals and replaces, in its entirety, Chapter 8 of the Hyattsville City Code to update, reorganize, and refine Chapter 8 to improve its overall clarity and better define the City's election policies and procedures. (FIRST READING).

#### Sponsor(s):

At the Request of the City Administrator

#### Co-Sponsor(s):

N/A

#### ATTACHMENTS

[Chapter 8 Revisions\\_11.15.18.pdf](#)

#### Summary Background:

A joint meeting of the Election Board and Ethics Commission was held after the 2017 Election to review the City Code. At this meeting, the stakeholders discussed lessons learned from the 2017 Election and recommendations for improvements. The drafted legislation was reviewed and revised several times by both bodies and staff before coming forward to Council. The proposed revisions to the City Election Code make the document easier to understand, ensures cohesive policies with all Election legislation, and includes recommended changes to improve voter and candidate experiences and facilitates fair and efficient City elections. Council discussed the proposed changes on October 15, 2018 and provided further direction on November 5, 2018. An updated version of the Election Code is attached.

#### Next Steps:

The ordinance is scheduled for a First Reading on November 19, 2018 and adoption on December 3, 2018. The ordinance will be effective 20 days after adoption, on December 23, 2018.

#### Fiscal Impact:

N/A

#### City Administrator Comments:

Recommend Approval

#### Community Engagement:

The City's Board of Supervisors of Elections and Ethics Commission previously provided their comments to the City Council for consideration and incorporation into the revised ordinance.

**Strategic Goals:**

Goal 1 – Ensure Transparent and Accessible Governance

**Legal Review Required?**

Complete

**CITY OF HYATTSVILLE**

**ORDINANCE 2018-06**

**An ordinance whereby the City Council repeals and replaces, in its entirety, Chapter 8 of the Hyattsville Code to update, reorganize, and refine Chapter 8 to improve its overall clarity and better define the City's election policies and procedures.**

**WHEREAS**, Maryland Annotated Code, The Local Government Article, Section 5-202 grants to municipal corporations of the State of Maryland, including the City of Hyattsville, the power to protect the health, comfort, and convenience of their citizens; and

**WHEREAS**, after the 2017 City election, the Mayor and City Council recognized that the City's election laws needed updating; and

**WHEREAS**, the Mayor and City Council deem it in the best interest of its citizens to update and clarify the elections Chapter to ensure that residents, City officials, and election participants alike can understand their rights, responsibilities, and obligations in City elections rules, to facilitate efficient and fair elections.

**NOW, THEREFORE, BE IT ORDAINED**, by the City Council of the City of Hyattsville in regular session assembled that Chapter 8 of the Hyattsville Code is hereby REPEALED in its entirety, and it is hereby REPLACED as follows:

**Chapter 8**

**ELECTIONS**

**ARTICLE I**

**General Provisions**

§ 8-1 Definitions.

§ 8-2 Powers and Duties of the Board of Supervisors of Elections.

**ARTICLE II**

**General Election Procedures**

§ 8-3 Election Day.

§ 8-4 Early Voting.

§ 8-5. Special Elections.

§ 8-6. Applications for Candidacy; Certification of Candidates; Withdrawal.

§ 8-7. Qualifications for Election Judges; Oath of Office.



1 **ARTICLE III**

2 **City Supplemental Voter Registry**

- 3 § 8-8. Supplemental Voter Registry.  
4 § 8-9 Application and Procedure.  
5

6 **ARTICLE IV**

7 **Provisional Ballots**

- 8 § 8-10. Eligibility for a Provisional Ballot  
9 § 8-11. Application.  
10 § 8-12. Locations and Procedure.  
11 § 8-13. Canvass of Provisional Ballots.  
12

13 **ARTICLE V**

14 **Vote-by-Mail Ballots**

- 15 § 8-14. General Provisions.  
16 § 8-15. Applications for Vote-by-Mail Ballots.  
17 § 8-16. Rejection or Approval of Applications for Vote-by-Mail Ballots.  
18 § 8-17. Form and Contents of Vote-by-Mail Ballots and Related Materials.  
19 § 8-18. Assistance in Marking Vote-by-Mail Ballots.  
20 § 8-19. Delivery of Completed Vote-by-Mail Ballots.  
21 § 8-20. Procedure for Canvassing Vote-by-Mail Ballots.  
22 § 8-21. Records and Retention of Ballots and Related Materials.  
23

24 **ARTICLE VI**

25 **Campaign Material and Other Persuasive Election Material**

- 26 § 8-22. Authority Lines.  
27 § 8-23. Posting Campaign Materials.  
28

29 **ARTICLE VII**

30 **Campaign Finance**

- 31 § 8-24. Appointment of a Treasurer.  
32 § 8-25. Duties and Authority of a Campaign Treasurer.  
33 § 8-26. Reports Required.  
34 § 8-27. Filing Reports.  
35 § 8-28. Form and Contents of Reports.  
36 § 8-29. Review of Reports; Financial Advisors.  
37 § 8-30. Campaign Accounts.

- 1 § 8-31. Restrictions on Campaign Contributions.  
2 § 8-32. Restrictions on the Use of Campaign Funds.  
3 § 8-33. Investigation of Campaign Finance Violations.  
4

## 5 **ARTICLE VIII**

### 6 **Complaints**

- 7 § 8-34. Scope of Duty and Authority.  
8

## 9 **ARTICLE IX**

### 10 **Enforcement, Prohibited Conduct, Penalties, and Appeals**

- 11 § 8-35. Enforcement.  
12 § 8-36. Prohibited Conduct.  
13 § 8-37. Penalties.  
14 § 8-38. Appeals.  
15

16 [HISTORY: Adopted by the Mayor and Council of the City of Hyattsville 12-1-69. Section 8-7C amended at time of adoption of Code;  
17 see Ch. 1, amended 02-20-07 by HO-2007-03 General Provisions, Art. I. Other amendments noted where applicable.]

#### 18 **GENERAL REFERENCES**

- 19 Registration, nominations and elections - See Charter, Art. IV.  
20 Administration of government - See Ch. 4.  
21 Code of Ethics - See Ch. 10.  
22 Peace and good order - See Ch. 87.

## 23 **ARTICLE I**

### 24 **General Provisions**

#### 25 **§ 8-1. Definitions.**

26 As used in this chapter, the following terms have the meanings indicated:

27 Board: Board of Supervisors of Elections for the City.

28 Campaign funds: Money that is contributed or loaned to a candidate.

29 Campaign material: Any material that: (1) contains text, graphics, or other images; (2) relates  
30 to a candidate, a prospective candidate, or the approval or rejection of a question; and (3) is  
31 published or distributed to anyone by, at the request of, or under the authority of, a candidate.

32 Candidate: Individual who seeks nomination for election, or seeks election, to City office.

33 Contribution: A donation, grant, or gift, or a promise to make a donation, grant, or gift, whether  
34 money or in-kind, to any candidate or representative, with exception to certain loans as set  
35 forth in this Chapter.

1       Contributor: Any person who makes a contribution.

2       Corporation: Any organization or entity that is formed or organized under the laws of  
3       Maryland, the United States, or any other state or foreign government.

4       Domestic Partner: Means an individual who is in a “domestic partnership” with another person  
5       that meets the requirements set forth in Maryland Code, § 6-101 of the Health--General Article,  
6       which may be amended from time to time.

7       Early voting day: A day close to, but in advance of, Election Day on which the City Council  
8       has authorized the polls to be open to qualified voters (referred to in the Charter, § C4-9 as  
9       “advance voting day”).

10      Election: General or special elections, referenda, or other questions at any election held by the  
11      City.

12      Election Day: The day on which voting for the offices of Mayor and Council and any other  
13      included referenda is regularly scheduled to occur as set forth by the City Charter and § 8-3 of  
14      this Chapter, which does not include special elections or early voting days.

15      Expenditure: Any transfer, disbursement, or promise of money or valuable thing, to include  
16      in-kind expenditures, by a candidate, treasurer, or other agent of a candidate to promote or  
17      assist in the promotion of the success or defeat of a candidate or proposition submitted to a  
18      vote at any election.

19      Financial institution: Any bank licensed to receive deposits and make loans which is insured  
20      by the Federal Deposit Insurance Corporation or a credit union insured by the National Credit  
21      Union Insurance Fund.

22      In-kind contribution: The fair market value, which shall be the usual and normal charge of  
23      anything of value other than direct contributions of money including goods, or services for  
24      which the contributor normally charges, and payments made on behalf of a candidate, except  
25      that volunteering the contributor’s own time or use of a personal vehicle to a campaign shall  
26      not constitute an in-kind contribution.

27      Political committee: Any combination of two (2) or more persons formed in any manner, which  
28      independently collects or expends a cumulative amount of one hundred dollars (\$100.00) or  
29      more to assist in the promotion of the success or defeat of any candidate or slate of candidates  
30      for City elective office or any cause to be submitted to the voters.

31      Report: A report of expenditures, loans, and contributions received by any candidate.

32      Surplus campaign funds: Unexpended funds contributed to a candidate that remain after the  
33      election is certified and all campaign debts, including all loans, have been paid.

34      Treasurer: Any person appointed by a candidate to receive or disburse money or other items  
35      of value to promote or assist in the promotion of any candidate or proposition.

1 Vote-by-Mail: The process whereby voters make application for and submit completed ballots  
2 by either mail or in-person drop-off at a location authorized by the Board.

3 **§ 8-2. Powers and Duties of the Board of Supervisors of Elections.**

4 A. Assistance from City Staff. In addition to any power, duty, or responsibility provided in  
5 the City Charter, the Board may obtain the assistance and support of City staff, with the  
6 approval of the City Administrator, to aid the Board in its official duties.

7 B. Administration and record-keeping. In addition to any power, duty, or responsibility  
8 provided in the City Charter, the Board shall have the authority to direct the City Clerk in:

9 (1) Issuing and maintaining all election records in a separate filing system provided by the  
10 City; and

11 (2) Keeping, maintaining, administering, and updating the City Supplemental Voter  
12 Registry and accepting, examining, and, as appropriate, approving registration applications  
13 for the Supplemental Voter Registry.

14 C. Campaign finance. The Board shall have authority to provide, receive, and review campaign  
15 reports, and certify that campaign reports are timely and complete as outlined in this Chapter,  
16 and the Board may delegate some or all of these responsibilities.

17 D. Election duties. In addition to any power, duty, or responsibility provided in the City  
18 Charter, the Board shall:

19 (1) Provide for the nominations for elected City officers;

20 (2) Verify the eligibility of election candidates and certify eligible candidates;

21 (3) Select and train election judges to assist in the operation of the polling places for City  
22 elections;

23 (4) Issue the official election ballot;

24 (5) Provide a form for the certificate of polling place challengers and watchers;

25 (6) Provide for voting by Vote-by-Mail ballot and provisional ballot;

26 (7) Prescribe and print or obtain all necessary election forms and related materials in  
27 sufficient time for their respective use, including applications for candidacy, Vote-by-Mail  
28 applications, Vote-by-Mail ballots, voter instructions, ballot envelopes, and related  
29 affidavits and statements as the Board deems necessary;

30 (8) Oversee the operations of the polling places;

31 (9) Validate the authenticity of returned Vote-by-Mail ballots and completed provisional  
32 ballots;

1 (10) Certify all election results; and

2 (11) Provide for recount of ballots.

3 E. Enforcement and review. In addition to any power, duty, or responsibility provided in the  
4 City Charter, the Board shall:

5 (1) Administer and enforce all election laws;

6 (2) Conduct administrative review of complaints as set forth in Article VIII of this Chapter;  
7 and

8 (3) Delegate the investigation and review of violations of Article VII to the City Ethics  
9 Commission per Chapter 10, § 10-1 of the City Code.

## 10 **ARTICLE II**

### 11 **General Election Procedures**

#### 12 **§ 8-3. Election Day.**

13 Elections, other than special elections, shall be held on the first Tuesday in May of each year  
14 an election for Mayor and/or Council regularly occurs. Polls shall be open to qualified voters  
15 and public notice provided in accordance with C4-9 of the City Charter.

#### 16 **§ 8-4. Early Voting.**

17 A. The City Council or Board may provide for one or more early voting days in any election.

18 B. Any early voting day shall be held no more than fifteen (15) days prior to the Election Day  
19 established in § 8-3 of this Article.

20 C. On a designated early voting day, the polls shall be open to qualified voters at the times and  
21 places specified and advertised by the Board, which shall be open a minimum of eight (8) hours  
22 if early voting is conducted on a Saturday and at least four (4) hours if early voting is conducted  
23 on any other day of the week.

#### 24 **§ 8-5. Special Elections.**

25 A. Generally. In addition to regularly scheduled elections, other special elections shall be held  
26 to resolve tie votes in any election and/or to fill vacancies that arise a substantial amount of  
27 time before the next regularly scheduled election, which shall be conducted pursuant to this  
28 Section.

29 B. Runoff elections.

30 (1) If, in any election directed by the Charter, any two (2) or more candidates for the office  
31 of Mayor or Councilmember who have received the highest number of votes receive an



1 equal number of votes, or the vote upon any binding referendum results in a tie, a runoff  
2 special election between these candidates and/or tied referenda shall be ordered and  
3 conducted by the Board.

4 (2) Any runoff special election required by Paragraph (1) of this Subsection shall be held  
5 within seventy-five (75) days of the election in which the tie vote occurred, shall include  
6 those offices for which the equal number of votes was cast or referendum questions which  
7 resulted in a tie vote.

8 C. Special elections to fill vacancy.

9 (1) If, at any point the office of Mayor and/or one or more seats on the Council become  
10 vacant, the Board shall, at the direction of the Council, conduct a vacancy special election  
11 to fill the vacancies.

12 (2) Except as provided in the City Charter, any special election shall be held within  
13 seventy-five (75) days of the date the vacancy was created.

14 (3) Notwithstanding any other provision of this Subsection, no special election to fill a  
15 vacancy shall be held if the special election can be conducted on any day that is within one  
16 hundred fifty (150) days of any regularly scheduled City election, and the office shall  
17 remain vacant until the regularly scheduled City election.

18 D. Combination special elections. If, in the event that an additional seat on the Council  
19 becomes vacant after a general election, but before a necessary runoff special election is held  
20 pursuant to Subsection (B) of this Section, the Board may extend the time for the runoff special  
21 election to any day within seventy-five (75) days of the date the vacancy was created and both  
22 the runoff and the vacancy elections shall be conducted at the same time.

23 **§ 8-6. Applications for Candidacy; Certification of Candidates; Withdrawal.**

24 A. All individuals wishing to have their name included on a ballot as a candidate for the offices  
25 of Mayor or Councilmember shall:

26 (1) file an application for candidacy on a form prescribed by the Board on or before 5:00  
27 p.m. on the last Friday in March in the year that the election is to be held;

28 (2) comply with any financial disclosure requirements of Chapter 10, § 10-9 of the City  
29 Code.

30 B. The Board shall timely review all applications for candidacy and conduct any necessary  
31 investigations to determine the eligibility of each applicant for candidacy, including verifying  
32 that candidates are residents of the City.

33 C. The Board may refuse to certify for candidacy any individual who, in any previous election,  
34 failed to file all reports required by this Chapter or has repeatedly or consistently failed to  
35 observe required election procedures.

1 D. The Board shall consider any mitigating circumstances in ruling on whether to certify an  
2 application for candidacy.

3 E. Candidates may withdraw their candidacy at any time on or before the Monday following  
4 the filing deadline for applications for candidacy set forth in this Section. Any candidate who  
5 withdraws shall file a disposition of funds report.

6 **§ 8-7. Qualifications for Election Judges; Oath of Office.**

7 A. All Election Judges appointed by the City Council or by the Board shall be registered voters  
8 of the City.

9 B. All persons listed in Subsection (A) of this Section shall, before engaging in their duties,  
10 take the oath set forth in § C12-1 of the City Charter and Article I, § 9 of the Maryland  
11 Constitution.

12 **ARTICLE III**

13 **City Supplemental Voter Registry**

14 **§ 8-8. Supplemental Voter Registry.**

15 A. The City Clerk shall maintain a supplemental voter registry of qualified voters who are not  
16 registered to vote pursuant to the State Universal Registration Act at the direction of the Board.

17 B. Any person qualified to vote in a City election and who is not registered to vote pursuant to  
18 the State Universal Registration Act is eligible to register for the City Supplemental Voter  
19 Registry.

20 C. Upon satisfaction of the application requirements as set forth in this Article, the City Clerk  
21 shall register the applicant on the City Supplemental Registry unless otherwise directed by the  
22 Board.

23 **§ 8-9. Application and Procedure.**

24 A. Any qualified person who wishes to be placed on the City Supplemental Voter Registry  
25 shall complete and submit an application to the Board.

26 B. Each City Supplemental Voter Registry application shall include, and each applicant shall  
27 be required to provide:

28 (1) the applicant's full name;

29 (2) the address of the applicant's primary residence;

30 (3) a declaration that the applicant meets the qualifications to vote in a City election as set  
31 forth in § C4-1 of the City Charter;

1 (4) a statement executed under the penalties of perjury declaring that all of the information  
2 included in the application is true to the best of the applicant's knowledge; and

3 (5) the applicant's signature.

4 C. In addition to the statements set forth in Subsection (B) of this Section, applicants are  
5 required to show proof of identity, age, and residency within the City.

6 D. Notwithstanding Subsection (C) of this Section, if the applicant is unable to provide  
7 sufficient documentary proof, the Board ~~may~~ shall waive one or more of those requirements if  
8 the applicant provides an additional affidavit executed under the penalties of perjury, stating  
9 that the applicant does not currently possess documentation that could be used to prove  
10 identity, age, and/or residency.

## 11 **ARTICLE IV**

### 12 **Provisional Ballots**

#### 13 **§ 8-10. Eligibility for a Provisional Ballot.**

14 An individual is eligible to cast a provisional ballot if:

15 A. The individual declares in a written affirmation under oath submitted with the  
16 provisional ballot that the individual is a registered voter in the State or the City and is  
17 eligible to vote in that election; and

18 B.(1) The individual's name does not appear on the City's election register or list of  
19 voters; or

20 (2) An election official asserts the individual is not eligible to vote.

#### 21 **§ 8-11. Application.**

22 Before an individual may cast a provisional ballot, the individual shall:

23 A. Complete and sign the provisional ballot application prescribed by the Board of  
24 Supervisors of Elections; and

25 B. Be provided a data sheet on how the individual may obtain information on whether the  
26 provisional vote was counted or not counted and the reasons therefore.

#### 27 **§ 8-12. Locations and Procedure.**

28 A. An eligible voter who completes an application shall be issued and may cast a provisional  
29 ballot at a polling location on Election Day or at an early voting location during early voting.

1 B. When cast, a provisional ballot shall either be enclosed in an envelope and secured in a  
2 locked box designated for such ballots or stored in an electronic format as specified by the  
3 Board.

4 **§ 8-13. Canvass of Provisional Ballots.**

5 A. The Board shall adopt regulations regarding the handling and canvassing of provisional  
6 ballots.

7 B. The envelope of a provisional ballot shall not be opened until the Board has approved the  
8 provisional ballot application for that ballot.

9 C. The Board may not reject a provisional ballot except by unanimous vote.

10 D. The Board shall reject a provisional ballot if:

11 (1) The individual is not qualified to vote in the election;

12 (2) The individual failed to sign the oath on the provisional ballot application;

13 (3) The individual cast more than one (1) ballot for the same election; or

14 (4) The provisional ballot is marked by an identifying mark that is clearly evident and can  
15 be used to identify the ballot.

16 E. The Board shall establish a system that permits individuals who have cast provisional ballots  
17 to determine whether their ballot was counted.

18 **ARTICLE V**

19 **Vote-by-Mail Ballots**

20 **§ 8-14. General Provisions.**

21 A. Any person qualified to vote in any election may use a Vote-by-Mail ballot pursuant to the  
22 provisions of this Article.

23 B. Subject to the provisions set forth in § 8-14. E., voters that have applied for and received a  
24 Vote-by-Mail ballot may only vote in that election by Vote-by-Mail ballot and are prohibited  
25 from voting in person at any polling place for that election.

26 C. No Vote-by-Mail ballot, completed or otherwise, shall be handled or delivered by a  
27 candidate or any individual volunteering or working for a candidate, except for their own ballot  
28 or that of their immediate family member or a member of their household.

29 D. No person may cast a vote using a Vote-by-Mail ballot that was issued by the City for  
30 another person.

1 E. Voters may choose to Vote-by-Mail permanently by completing the required form  
2 provided by the City Clerk's office. The form must be submitted to the City Clerk no less than  
3 10 days before any City election. The City Clerk shall maintain a list of all permanent Vote-  
4 by-Mail voters. Any permanent Vote-by-Mail voter may revoke their status as a permanent  
5 Vote-by-Mail voter at any time. The City Clerk shall remove from the list any permanent  
6 Vote-by-Mail voter who has not voted in ~~three~~ two consecutive election cycles.

7 **§ 8-15. Applications for Vote-by-Mail Ballots.**

8 A. Printed forms of applications for Vote-by-Mail ballots in accordance with the requirements  
9 of this Chapter shall be provided by the Board and shall be available to any qualified voter.

10 B. A qualified voter desiring to vote at any election with a Vote-by-Mail ballot shall make an  
11 application, in writing, to the Board prior to the deadline established in Subsection (D) of this  
12 Section.

13 C. Applications for Vote-by-Mail ballots shall include the following:

14 (1) the applicant's name and residence address, including the street and number;

15 (2) a statement indicating that the applicant is a qualified voter at the residence address  
16 given;

17 (3) whether the ballot should be held for pick-up at the City Municipal Building or mailed  
18 to the applicant, and if mailed, the address to which the ballot is to be delivered if different  
19 from the applicant's resident address;

20 (4) an affidavit executed under the penalties of perjury stating that all of the information  
21 included in the application is true to the best of the applicant's knowledge; and

22 (5) the applicant's signature.

23 D. Application deadlines. (1) Applications that request a ballot be held for pick-up at the City  
24 Municipal Building shall be filed with the Board no later than 10:00 a.m. on the last day the  
25 City offices are open for regular business before Election Day.

26 (2) Applications that request delivery of a ballot by mail shall be filed with the Board no  
27 later than the close of business ten (10) days prior to Election Day.

28 **§ 8-16. Rejection or Approval of Applications for Vote-by-Mail Ballots.**

29 A. Review of applications. (1) The Board shall review and approve or reject all Vote-by-Mail  
30 applications as soon as reasonably practicable and without delay.

31 (2) All applications that request delivery of a Vote-by-Mail ballot by mail shall be approved  
32 or rejected no later than seven (7) days prior to Election Day.



1 B. Rejection of applications. (1) The Board shall reject any application for a Vote-by-Mail  
2 ballot if:

3 (a) the application is not filed before the applicable deadline;

4 (b) the application is missing any of the information required by § 8-15 of this Article;

5 (c) the applicant is not eligible to vote;

6 (d) the Board has already granted a previous application filed by that applicant; or

7 (e) the voter has already voted in person on an early voting day.

8 (2) The Board may not reject the Vote-by-Mail application of any person except by  
9 unanimous vote.

10 (3) If a Vote-by-Mail application is rejected, the Board shall promptly notify the applicant  
11 of the reason(s) therefore.

12 C. Approval of applications; delivery of Vote-by-Mail ballots. (1) If an application is not  
13 rejected under Subsection (B) of this Section, the Board shall, as soon as reasonably  
14 practicable, mail the applicant's ballot or make the ballot available for pickup at the office of  
15 the Board if the applicant so indicated on their application.

16 (2) The Board shall mail all ballots that approved applicants have requested to be delivered  
17 by mail no later than seven (7) days prior to Election Day.

18 (3) If the applicant is entitled to free postage privileges under any federal law, rule, or  
19 regulation, the Board shall take full advantage of these privileges.

20 (4) Not more than one (1) Vote-by-Mail ballot may be mailed or provided to any applicant  
21 unless the Board has reasonable grounds to believe that the Vote-by-Mail ballot previously  
22 mailed has been lost, destroyed, or spoiled.

23 (5) Upon the mailing or delivery of a Vote-by-Mail ballot, the Board shall:

24 (a) remove the approved applicant's voter record card from the precinct binder and  
25 place it in a separate binder marked "Registered Vote-by-Mail Voters," which shall be  
26 retained in the office of the City Clerk; and

27 (b) place a marker in the regular precinct binder that indicates the voter's name, that a  
28 Vote-by-Mail ballot has been mailed or delivered, and the date on which the ballot was  
29 sent or delivered.

30 **§ 8-17. Form and Contents of Vote-by-Mail Ballots and Related Materials.**

31 A. The Board shall prescribe the size, form, arrangement, and printed contents of Vote-by-Mail  
32 ballots, except that all such ballots shall:

(1) be in paper form;

(2) display the heading “Vote-by-Mail Ballot” printed in large letters in a clear space at the top of each paper ballot;

(3) display the following instructions printed in large letters in a clear space below the ballot heading: “Mark ballot by placing X in proper blank after each candidate or question. Do not erase or make identifying marks.”;

(4) clearly display the applicable election ward;

(5) list candidates by office and then alphabetically by last name within each office; and

(6) list referendum questions following the listing of candidates for all offices.

B. The Board shall prescribe the size, form, arrangement, and printed contents of the following materials, which shall be included with every Vote-by-Mail ballot:

(1) Vote-by-Mail ballot material envelopes, providing for a covering envelope, a ballot envelope, and a return envelope;

(2) printed instructions for the marking and casting of Vote-by-Mail ballots; and

(3) a certification of assistance form.

**§ 8-18. Assistance in Marking Vote-by-Mail Ballots.**

A. Any qualified voter who is unable to mark their own ballot due to a physical disability may receive assistance in marking a Vote-by-Mail ballot.

B. Any person assisting another voter in the marking of a Vote-by-Mail ballot shall complete the required certification of assistance included with the ballot, which shall be executed under the penalties of perjury and returned with the completed ballot.

**§ 8-19. Delivery of Completed Vote-by-Mail Ballots.**

Completed Vote-by-Mail ballots may be delivered:

A. by mail to the address designated by the Board; or

B. by hand to any of the following:

(1) the City Clerk’s office during normal business hours;

(2) the Board or a chief election judge during voting hours at any polling place on any Election Day or early voting day; or

(3) the Board at any other place and time designated by the Board.

1   **§ 8-20. Procedure for Canvassing Vote-by-Mail Ballots.**

2       A. Time for opening or unfolding ballots. The Board shall not open or unfold any Vote-by-  
3       Mail ballot at any time before the closing of the polls and the beginning of the canvass of the  
4       ballots.

5       B. Procedure generally. (1) Immediately following the canvass of the votes cast at the regular  
6       voting places in the City on Election Day, the Board shall meet at the City Municipal Building  
7       and shall proceed to count, certify, and canvass the Vote-by-Mail ballots contained in the ballot  
8       envelopes received before the closing of the polls on Election Day.

9               (2) This canvass shall be conducted by ward in accordance with the applicable provisions  
10              of § C4-11 of the City Charter.

11             (3) All Vote-by-Mail voters' applications, certifications, ballot envelopes, and ballots shall  
12             be kept separate and apart from other ballot types and election materials.

13             (4) Before opening any ballot, the Board shall inspect the ballot and determine the  
14             following:

15               (a) that the provisions for filling out and signing the oath on the outside of the ballot  
16               envelope have been substantially complied with;

17               (b) that the voter is entitled to vote under this Chapter in a ward of the City; and

18               (c) that the voter has not already voted on Election Day.

19             (5) If the Board is satisfied that a ballot meets all of the criteria set forth in Paragraph (4)  
20             of this Subsection, the Board shall open the ballot envelope, remove the ballot therefrom,  
21             place the ballot in a Vote-by-Mail ballot box, and enter in the appropriate register the fact  
22             that the voter whose name appears thereon has voted, using the initials "VBM" to indicate  
23             the vote has been by a Vote-by-Mail ballot.

24       C. Rejection of Vote-by-Mail ballots. (1) The Board may reject a Vote-by-Mail ballot only by  
25       unanimous vote of the entire Board.

26             (2) Vote-by-Mail ballots may be marked by any kind of ~~pencil or~~ ink so long as it permits  
27             the Board to ascertain the voter's unambiguous choices.

28             (3) Vote-by-Mail ballots shall be rejected and not counted if:

29               (a) the ballot was received by the Board after the closing of the polls on Election Day;

30               (b) the voter's oath is not sufficiently executed;

31               (c) there is more than one (1) ballot in the ballot envelope, in which case all shall be  
32               rejected;

33               (d) the ballot was cast by a person not eligible to vote;

1 (e) the voter has already voted in person;

2 (f) the voter has marked more choices than is permissible for a specific contest or the  
3 ballot is marked in a manner that makes the voter's choice(s) ambiguous, in which case  
4 the Board shall invalidate only the vote(s) for the specific contest(s) that are improperly  
5 or ambiguously marked and shall not invalidate the remainder of the ballot, which shall  
6 be counted, certified, and canvassed unless rejected for another reason;

7 (g) the Board receives from the same person before the closing of the polls on election  
8 day more than one (1) Vote-by-Mail ballot, in which case the Board shall count, certify,  
9 and canvass only the Vote-by-Mail ballot with the earliest date and the other shall be  
10 rejected, or, if both are undated or dated the same, both ballots shall be rejected;

11 (h) the ballot contains a vote for a person who has ceased to be a candidate, in which  
12 case the Board shall invalidate only that vote for that specific contest and shall not  
13 invalidate the remainder of the ballot, which shall be counted, certified, and canvassed  
14 unless rejected for another reason; and/or

15 (i) the Board determines that the voter has died before Election Day as set forth in  
16 Subsection (D) of this Section.

17 D. Death of a Voter. (1) Whenever the Board determines from proof of investigation that any  
18 person who has cast a Vote-by-Mail ballot has died before Election Day, the Board shall not  
19 count the ballot of the deceased voter, but it shall be preserved with the rest of the canvassed  
20 ballots pursuant to § 8-21 of this Article.

21 (2) Notwithstanding Paragraph (1) of this Subsection, if, at or before the time of counting  
22 and canvassing, the Board has not determined that a person who cast a Vote-by-Mail ballot  
23 had died before Election Day, that voter's ballot shall be counted, and the fact that the voter  
24 may later be shown to have been actually dead on Election Day shall not invalidate the  
25 ballot or the election.

26 **§ 8-21. Records and Retention of Ballots and Related Materials.**

27 A. The Board shall keep, pursuant to the City's Record Retention Policy, a record of  
28 Vote-by-Mail applications and shall retain Vote-by-Mail ballots, ballot envelopes,  
29 certifications, and applications received.

30 B. The records retained pursuant to this Section shall be made available for examination by  
31 any registered voter or as the Maryland Public Information Act or other State or federal law  
32 may require or prohibit such disclosure.

1 **ARTICLE VI**

2 **Campaign Material and Other Persuasive Election Material**

3 **§ 8-22. Authority Lines.**

4 A. Except as otherwise provided in this section, each item of campaign material shall contain  
5 an authority line, set apart from any other message, that states the name, title, and address of  
6 the person responsible for the publication or distribution of the same, except that an address  
7 need not be included if the responsible person is registered with the City Clerk.

8 B. Any material that is published or distributed in support of, or in opposition to, a candidate,  
9 referendum, or election question without being directly or indirectly authorized by the  
10 candidate as provided in this Section shall include the following statement: "Authorized and  
11 paid for by (name of payer or any organization affiliated with the payer). This message has not  
12 been authorized or approved by any candidate."

13 C. The provisions of this Section apply to all campaign materials, including those that are  
14 distributed and published electronically and through social media.

15 D. Notwithstanding any other provision in this Section, material need not contain an authority  
16 line if the item is too small to include all the information required by this Section in a legible  
17 form, except that reasonable effort shall be made to include as much legible information as  
18 possible, even if in truncated form.

19 **§ 8-23. Posting Campaign Materials.**

20 The posting or display of campaign materials, including, but not limited to, signs, clothing,  
21 flyers, and other displays, shall be conducted in compliance with any applicable federal,  
22 state, and local laws.

23 **ARTICLE VII**

24 **Campaign Finance**

25 **§ 8-24. Appointment of a Treasurer.**

26 A. Each candidate shall appoint one (1) treasurer and shall file the name and address of the  
27 treasurer, together with the treasurer's acceptance of the appointment in writing, on a form  
28 provided by, and returned to, the City Clerk prior to the filing deadline for candidacy set forth  
29 in § 8-6 of this Chapter.

30 B. In the event of the resignation of an appointed treasurer, the candidate must immediately  
31 inform the Board and shall within seventy-two (72) hours appoint a new treasurer and so  
32 inform the Board in writing.



1 C. A candidate may serve as treasurer so long as the candidate has not received ~~and does not~~  
2 ~~intend to receive~~ total contributions of more than one thousand dollars (\$1000.00), excluding  
3 contributions to a candidate's campaign if made by a candidate or the candidate's spouse or  
4 domestic partner.

5 D. In the event the contributions exceed the amount in Subsection (C) of this Section, the  
6 candidate must, within two (2) days, report such to the City Clerk, appoint a treasurer, and file  
7 the appropriate form(s).

8 E. The Board or the Clerk shall promptly send a written notice to any candidate who is required  
9 to appoint a treasurer but who fails to do so. Such notice shall also be posted on the City's  
10 website and on the City's bulletin board.

11 **§ 8-25. Duties and Authority of a Campaign Treasurer.**

12 A. All campaign assets shall be delivered to, and maintained by, a candidate's treasurer.

13 B. No campaign assets may be disbursed or disposed of by any person other than the treasurer.

14 C. Treasurers are responsible for timely filing reports as required by this Chapter.

15 D. The duties of a treasurer may not be transferred or delegated to another person, except that  
16 a candidate may simultaneously be a candidate and serve as treasurer pursuant to § 8-24(C) of  
17 this Article.

18 **§ 8-26. Reports Required.**

19 A. The treasurer for each candidate for the office of Council or Mayor, or the candidate serving  
20 as their own treasurer, shall file reports in accordance with this Article.

21 ~~B. Notwithstanding any other provision in this Article, a candidate is not required to file reports~~  
22 ~~otherwise required by this Article if the candidate files an Affidavit of Limited Contributions~~  
23 ~~and Expenditures averring that the candidate will not accept campaign contributions in excess~~  
24 ~~of one thousand dollars (\$1000.00) cumulatively or make expenditures in excess of one~~  
25 ~~thousand dollars (\$1000.00) cumulatively. Any candidate who files an Affidavit of Limited~~  
26 ~~Contributions and then accepts or expends in excess of one thousand dollars (\$1000.00) shall~~  
27 ~~immediately comply with the requirements for candidates who have not filed an Affidavit of~~  
28 ~~Limited Contributions and have received more than one thousand dollars (\$1000.00).~~

29 ~~C.~~ B. The City Clerk shall make all reports and/or affidavits filed pursuant to this Article  
30 available for examination by any member of the public.

31 ~~D.~~ C. Any report filed with the City as required by this Chapter shall also be filed with the State  
32 Board of Elections as required by State law, including pursuant to Maryland Code, § 4-108.2  
33 of the Local Government Article, which may be amended from time to time.

1 ~~ED.~~ A candidate shall not be seated and sworn as an elected official and shall not receive a  
2 salary until all reports required by this Chapter are filed in substantial compliance with the  
3 requirements of this Chapter as well as all reports required by the City's Ethics Ordinance.

4 **§ 8-27. Filing Reports.**

5 A. Reports required by this Article shall be filed pursuant to the following schedule:

6 (1) Initial Report: An initial report shall be filed on the twenty-first (21st) day proceeding  
7 Election Day.

8 (2) Second Report: A second report shall be filed on the seventh (7th) day preceding  
9 Election Day.

10 (3) Annual Reports: An annual report shall be filed on or before the first Tuesday in  
11 September of each year until the cash balance, unpaid bill(s), or deficit is eliminated and a  
12 final annual report reflecting the disposition of funds is filed with the City Clerk's Office  
13 per § 8-32.

14 (4) Corrected Reports: Corrected reports shall be filed in the time frame established in  
15 § 8-29(B) of this Article.

16 B. Reports must be filed with the office of the City Clerk by 1:00 p.m. on the day they are due.

17 C. The City Clerk shall promptly send a written notice to any candidate and the candidate's  
18 treasurer who fails to timely file a campaign finance report. Such notice shall also be posted  
19 on the City's website and on the City's bulletin board.

20 **§ 8-28. Form and Contents of Reports.**

21 A. All reports shall be made on forms or in a format provided by the City Clerk and approved  
22 by the City Attorney.

23 B. Each report shall include the information set forth in Subsection C of this Section that  
24 occurred during the following time frames:

25 (1) The initial report shall include information from the preceding election, or the most  
26 recent annual report, if applicable, up to and including the full day before the filing of the  
27 initial report.

28 (2) All other reports shall include information starting from the full day that the previous  
29 report was filed up to and including the full day before the filing of the current report.

30 C. Each report filed shall include:

31 (1) the total and individual amounts of all contributions the candidate or candidate's  
32 treasurer received;

(2) the total and individual amounts of all expenditures which the candidate or candidate's treasurer, or any person acting on their behalf made;

(3) receipts and/or other documentation for all expenditures reported, which shall include dates, amounts, and information to identify each contributor and recipient of funds;

(4) the total and individual amounts of all loans the candidate or candidate's treasurer received;

(5) documentation indicating the nature, terms, and status of each loan; and

(6) any balance from the prior reporting period.

D. Notwithstanding any other provision in this Article, a report need not itemize the campaign contributions made by the candidate or the candidate's spouse or domestic partner but may aggregate these contributions under one line or total.

E. Unless otherwise provided by the Board, all reports shall be executed under the penalties of perjury by the treasurer of the candidate or by the candidate if the candidate is not required to have a treasurer.

#### **§ 8-29. Review of Reports; Financial Advisors.**

A. Responsibility to ensure accurate reporting. The Board is responsible for ensuring that all forms and campaign finance reports are in substantial compliance with this Chapter.

B. Notification and correction of deficient reporting. (1) If the Board or their designee discovers a reporting inaccuracy or other deficiency in a report filed pursuant to this Article, it shall notify in writing the candidate and the treasurer of the candidate, if any, and a corrected report shall be filed by the treasurer within:

(a) forty-eight (48) hours after the City Clerk sends notice if the report to be corrected was filed pursuant to Paragraphs (1) or (2) of § 8-27(A) of this Chapter; or

(b) seven (7) days after the City Clerk sends notice if the report to be corrected is an annual report required to be filed pursuant to Paragraph (3) of § 8-27(A) of this Chapter.

(2) Failure to file a corrected report within applicable time established by this Subsection shall render the report overdue and may result in penalties pursuant to Article IX of this Chapter.

(3) Notwithstanding any other provision of this Subsection, if the inaccuracy or deficiency in a report is de minimis or other good cause is shown, the Board may, with or without a hearing, waive the inaccuracy or deficiency and the requirement to file a corrected report.

C. Financial advisors. (1) The Board may appoint one or more individuals with some expertise in reading financial statements to aid the Board in reviewing reports filed pursuant to this Article.

(2) The Board may direct financial advisor(s) to:

(a) promptly review all reports filed pursuant to this Article;

(b) notify the candidate, treasurer, and/or Board of any irregularities, discrepancies, or errors the reports;

(c) recommend actions to the Board, if any.

**§ 8-30. Campaign Accounts.**

If contributions received by a candidate exceed a total of one thousand dollars (\$1000.00), all campaign funds must be deposited into one account opened with a financial institution and such funds shall not be commingled with any other funds or accounts.

**§ 8-31. Restrictions on Campaign Contributions.**

A. Maximum contribution. No candidate or treasurer may accept from a single person, and no person may give or promise to any single candidate, contributions that total over five hundred dollars (\$500.00) per election.

B. Candidate and spouse or domestic partner contributions and loans. (1) The contributions or loans of a candidate or the candidate's spouse or domestic partner to the candidate's own campaign shall not be subject to, or included in, the dollar limitations set forth in this Section.

(2) Any contributions or loans made by a candidate or candidate's spouse or domestic partner to the candidate's own campaign shall pass through the candidate's campaign account, if any, and be reported, however, they need not be itemized and can be aggregated under one line or total.

C. Contributions from prohibited persons. No candidate shall knowingly accept or solicit a contribution from:

(1) an anonymous contributor;

(2) a corporation, including labor unions and political committees;

(3) a person making a contribution in the name of another; or

(4) a foreign national, which includes:

(a) a person outside of the United States who is not a citizen of the United States;

(b) an individual within the United States who is not a citizen of the United States and who is not lawfully admitted for permanent residence;

(c) a government of a foreign country;

(d) a political party of a foreign country;

1 (e) any partnership, association, corporation, organization, or other combination of  
2 persons organized under the laws of, or having its principal place of business in, a  
3 foreign country; or

4 (f) any other foreign person that is prohibited from making contributions by federal  
5 law, including 52 U.S.C. § 30121 and 11 CFR 110.20, which may be amended from  
6 time to time.

7 D. If any candidate or treasurer receives a contribution prohibited by this Section, that  
8 candidate shall either return the contribution to the contributor promptly or shall forfeit that  
9 contribution to the City promptly, which forfeiture may be used for any public purpose.

10 E. Campaign loans. (1) Except as set forth in Subsection (B) of this Section, the total amount  
11 of all loans to a candidate for any election shall not exceed five thousand dollars (\$5,000.00),  
12 and no one person or entity may loan a candidate more than one thousand dollars (\$1000.00).

13 (2) A loan to a candidate is considered a contribution unless:

14 (a) the loan is from a financial institution or other entity in the business of making  
15 loans; or

16 (b) the loan is to the candidate and repayment is personally guaranteed by the candidate  
17 and is due within one year of the date of the loan.

18 (3) If the amount of interest actually charged on a loan to a candidate is less than the prime  
19 rate on the day the loan is made, the difference between the actual interest charged and that  
20 prime rate shall constitute a contribution.

21 (4) All campaign loans shall be documented on campaign finance reports in a format  
22 provided by the City Clerk and approved by the City Attorney.

23 **§ 8-32. Restrictions on the Use of Campaign Funds.**

24 A. Personal use of campaign funds prohibited. (1) No candidate may use campaign funds for  
25 any personal use, which is an obligation or expense of any person that would exist irrespective  
26 of the campaign of a candidate.

27 (2) Personal use includes, but is not limited to:

28 (a) household food items or supplies;

29 (b) clothing, other than items of de minimis value that are used in the campaign  
30 (examples of de minimis campaign clothing include, but are not limited to, campaign  
31 logo “T-shirts” and caps with campaign slogans);

32 (c) mortgage or rent payments for the personal residence or property of a candidate or  
33 the candidate’s family;



- (d) vacations;
- (e) tickets or admission to entertainment, such as a concert or theater performance; and
- (f) salary payments to a member of the candidate's family.
- B. Campaign funds may not be utilized in any election other than one held by the City.
- C. Cash withdrawals are prohibited.
- D. Campaign funds shall not be used to pay a fine for a violation of this Chapter.
- E. No person other than a candidate, treasurer, or other agent with specific written authorization by the candidate shall make an expenditure from any campaign account.
- F. Retention and disposition of surplus funds. (1) After an election, surplus funds may be retained and may be used by the candidate in any election to support the candidate's election or reelection to any City office. The candidate and the candidate's treasurer shall meet all applicable requirements of this Chapter with respect to maintaining and accounting for the surplus funds including, but not limited to filing all annual reports. (2) The candidate may also choose to dispose of surplus funds in accordance with § 8-32F(2)(a) – (d).
- (a) Returned, pro rata, to the contributors by the treasurer;
- (b) Paid to a charitable organization registered or exempt from registration pursuant to Maryland Code, Title 6 of the Business Regulation Article, which may be amended from time to time;
- (c) Paid to a local board of education or to a recognized nonprofit organization providing services or funds for the benefit of pupils or teachers; and/or
- (d) Paid to any public or private institution of higher education in the State for scholarship or loan purposes.
- (3) Except where surplus campaign funds are returned to contributors, such funds shall not be converted to personal use.
- (4) Candidates or their treasurers shall make a record of all dispositions of surplus campaign funds.
- (5) Within 30 days of the disposition of all of a candidate's surplus funds, or on or before the first Tuesday in September following the complete disposition of the candidate's surplus funds, whichever is earlier, the candidate or the candidate's treasurer shall file:
- (a) an annual report as set forth in § 8-27(A)(3) and 8-28 of this Article VII; and
- (b) an affidavit with the City Clerk stating that the campaign accounts are closed and detailing how the funds were distributed.

(c) Within 30 days of paying off a campaign loan, a candidate shall cause to be filed an affidavit stating that the loan is paid in full with supporting documentation from the lender.

**§ 8-33. Investigation of Campaign Finance Violations.**

A. Notwithstanding any other provision in this Chapter, the Board or their designee shall have concurrent jurisdiction to investigate any violations of this Article and enforce the provisions thereof, and the Board is not required to investigate or resolve matters being addressed by the City Ethics Commission.

B. The City Administrator and/or the City Clerk shall monitor and make appropriate recommendations to the Board and the Ethics Commission in the event of duplicative investigations or hearings.

**ARTICLE VIII**

**Complaints**

**§ 8-34. Scope of Duty and Authority.**

A. The Board shall investigate and resolve any written complaints or contests relating to voting, the validity of any ballot, candidate certification, violations of this Chapter, or other City election matters within the authority granted to the Board by the City Charter or Code.

B. When reviewing a complaint, contest, or other potential violation within its authority pursuant to this Article, the Board has the power to:

(1) conduct a reasonable investigation;

(2) conduct one or more hearings;

(3) adopt reasonable rules and procedures for the conduct of hearings that are not inconsistent with this Article;

(4) summon concerned parties and/or necessary witnesses to hearings;

(5) dismiss a complaint;

(6) conciliate a complaint;

(7) issue orders;

(8) implement enforcement actions as provided by this Section; and

(9) extend the time for any hearing and the issuance of any finding, opinion, and/or orders.

## ARTICLE IX

### Enforcement, Prohibited Conduct, Penalties, and Appeals

#### § 8-35. Enforcement.

The Board may enforce the provisions of this Chapter by:

A. issuing cease and desist orders;

B. imposing fines as set forth in this Article;

C. imposing conditions, mandates, or prohibitions on any violator as the Board determines to be appropriate, including requiring a violator to take corrective action;

D. seeking judicial enforcement of its decisions by application to courts of competent jurisdiction for injunctions, mandamus, and other appropriate judicial review when conducting an administrative review; and

E. referral of complaints to the Office of the State's Attorney for prosecution as the circumstance may warrant.

#### § 8-36. Prohibited Conduct.

A. It is unlawful to violate any provision of this Chapter.

B. It is unlawful for any person to knowingly and willfully:

(1) sign, under oath, affirmation, and/or the penalties of perjury any application, affidavit, or other document pursuant to this Chapter that contains false information;

(2) violate any provision of this Chapter with the intent to cast an illegal vote;

(3) apply for, cast, or attempt to cast a ballot, including a provisional or Vote-by-Mail ballot, under any name other than their own name;

(4) cast or attempt to cast a Vote-by-Mail ballot that was not issued by the City for that person;

(5) publish or distribute, for the purpose of influencing votes, any material that contains a false or substantially misleading authority line;

(6) canvass or open any Vote-by-Mail ballot or envelope, other than their own, prior to the time for canvassing set forth in Article V of this Chapter;

(7) accept, make, or solicit any contribution prohibited by this Chapter or State or federal law;

(8) fail to promptly forfeit unlawful contributions as required by this Chapter or State or federal law;

(9) use or dispose of campaign funds in violation of this Chapter or State or federal law; or

(10) handle a completed voter registration application other than the voter's own application, except that this prohibition does not apply to City, State, or Federal government officials and employees engaging in official business.

**§ 8-37. Penalties.**

A. Any person who commits any violation set forth in Subsection (B) of § 8-36 of this Article, or knowingly aids or abets another in committing such a violation, shall be guilty of a misdemeanor and, upon conviction, be subject to a fine of not more than one thousand dollars (\$1000.00), imprisonment of not more than six (6) months, or both, at the discretion of the Court.

B. The Board may impose a fine of up to five hundred dollars (\$500.00) on any person who fails to:

(1) include an authority line on campaign materials, if required, that is in substantial compliance with the requirements set forth in § 8-22 of this Chapter;

(2) timely appoint a treasurer and file the correct forms as required by § 8-24 of this Chapter;

(3) promptly establish, and properly maintain, a campaign account as required by § 8-30 of this Chapter; or

(4) comply with an order of the Board.

C. The Board or its designee may impose a fine of up to five hundred dollars (\$500.00) on any candidate and/or any treasurer of a candidate if any report or affidavit required by Article VII is not timely filed.

D. The Board or its designee may impose a fine of up to one hundred dollars (\$100.00) for any violation of this Chapter, including the prohibited conduct set forth in § 8-36 of this Article, except that a person may not be fined under this Subsection if a fine or penalty is imposed under Subsections (A), (B), or (C) of this Section.

E. After notification of a violation and for each day the violation continues, the Board may impose additional fines up to the amounts indicated in Subsections (B), (C), and (D) of this Section, respectively, if an infraction set forth in those Subsections is not abated within a reasonable time.

F. The Board may impose a fine of up to two hundred dollars (\$200.00) on any person that fails to appear at a hearing after receiving a summons from the Board.

1 G. In addition to any other fine, penalty, or sanctions, the City Council may, after notice and a  
2 hearing, impose such censure or penalty on any person elected who has violated Article VII of  
3 this Chapter that the Council deems reasonable and appropriate, including a refusal to seat the  
4 individual, removal from office, and a declaration that the seat is vacant.

5 **§ 8-38. Appeals.**

6 ~~A. Any person who is aggrieved by any decision or action of the Board, or the City Ethics~~  
7 ~~Commission when it is enforcing any provision of this Chapter, shall have the right to appeal~~  
8 ~~the decision within thirty days to the Council by submitting a written petition to the City Clerk~~  
9 ~~within fifteen (15) days of the decision or action. Circuit Court for Prince George's County,~~  
10 ~~which shall review the matter *de novo* and without a jury.~~

11 ~~B. If any person who appeals pursuant to Subsection (A) of this Section is aggrieved by the~~  
12 ~~decision of the Council, they may appeal the Council's decision to the Circuit Court for Prince~~  
13 ~~George's County, which shall review the matter *de novo* and without a jury.~~

14 **AND BE IT FURTHER ORDAINED** that if any provision of this Ordinance or the  
15 application thereof to any person or circumstance is held invalid for any reason, such invalidity  
16 shall not affect the other provisions or any other applications of the Ordinance which can be  
17 given effect without the invalid provision or applications, and to this end, all the provisions of  
18 this Ordinance are hereby declared to be severable;

19 **AND BE IT FURTHER ORDAINED** that this Ordinance shall take effect twenty (20)  
20 days from the date of its adoption;

21 **AND BE IT FURTHER ORDAINED** that a fair summary of this ordinance shall  
22 forthwith be published twice in a newspaper having general circulation in the City and otherwise  
23 be made available to the public.

24 **INTRODUCED** by the City Council of the City of Hyattsville, Maryland, at a regular  
25 public meeting on November 19, 2018.

26 **ADOPTED** by the City Council of the City of Hyattsville, Maryland, at a regular public  
27 meeting on December 3, 2018.

Adopted: \_\_\_\_\_

Attest: \_\_\_\_\_  
Laura Reams, City Clerk

\_\_\_\_\_  
Candace B. Hollingsworth, Mayor

30 { } indicate deletions

31 \_\_/BOLD indicates additions

- 1 Asterisks \* \* \* Indicate matter retained in existing law but omitted herein
- 2
- 3 Effective Date: December 23, 2018





## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Ordinance

Agenda Section: Action Items (8:35 p.m. - 9:15 p.m.)

### SUBJECT

Hyattsville Ordinance 2018-07, Amendment to Chapter 10, Ethics (5 minutes)

### HCC-151-FY19

#### Recommendation:

I move that the Mayor and Council introduce Hyattsville Ordinance 2018-07, an Ordinance whereby the City of Hyattsville amends its ethics provisions to conform with contemporaneous changes to the City's Election laws. (FIRST READING).

#### Sponsor(s):

At the Request of the City Administrator

#### Co-Sponsor(s):

N/A

#### ATTACHMENTS

[Chapter 10 Revisions\\_10.11.18.pdf](#)

#### Summary Background:

Throughout the revision process of the City's Election legislation, inconsistencies in the Ethics Code pertaining to the Candidate Withdrawal date were found. The proposed revisions to the City Ethics Code aligns the document with all Election legislation and facilitates fair and efficient City elections. An updated version of the Ethics Code is attached.

#### Next Steps:

The ordinance is scheduled for a First Reading on November 19, 2018 and adoption on December 3, 2018. The ordinance will be effective 20 days after adoption, on December 23, 2018.

#### Fiscal Impact:

N/A

#### City Administrator Comments:

Recommend Approval

#### Community Engagement:

The City's Board of Supervisors of Elections and Ethics Commission previously provided their comments to the City Council for consideration and incorporation into the revised ordinance.

#### Strategic Goals:

Goal 1 – Ensure Transparent and Accessible Governance

#### Legal Review Required?

Complete



**CITY OF HYATTSVILLE  
ORDINANCE 2018-07**

**An Ordinance whereby the City of Hyattsville amends its ethics provisions to conform with contemporaneous changes to the City's Election laws.**

**WHEREAS**, the City of Hyattsville repealed and re-enacted Chapter 8 of its Code which governs the City's elections; and

**WHEREAS**, the Council finds it necessary and in the public interest to amend Chapter 10 of the City of Hyattsville Code to be consistent with the repealed and re-enacted Chapter 8.

**NOW, THEREFORE, BE IT ORDAINED** by the City Council of the City of Hyattsville in regular session assembled that Chapter 10 is hereby amended as follows:

**§ 10-9. Filing of financial disclosure statement.**

\* \* \*

B. Candidates to be local elected officials. . . .

\* \* \*

3. If a candidate fails to file a statement required by this section ~~after written notice is provided by the City Clerk or Board of Election Supervisors at least 20 days before the last day for the withdrawal of candidacy, the candidate is deemed to have withdrawn the candidacy in accordance with the deadline for filing applications for candidacy established in Chapter 8 of this Code, the candidate must file the statement required by this section no later than 5:00 p.m. on the second full business day after the City Clerk sends written notice to the candidate of the deficiency or the candidate is deemed to have withdrawn the application for candidacy. For the purposes of this subparagraph, time commences running upon the Clerk transmitting the written notice by electronic or other means.~~

**AND BE IT FURTHER ORDAINED** that if any provision of this Ordinance or the application thereof to any person or circumstance is held invalid for any reason, such invalidity shall not affect the other provisions or any other applications of the Ordinance which can be given effect without the invalid provision or applications, and to this end, all the provisions of this Ordinance are hereby declared to be severable;

**AND BE IT FURTHER ORDAINED** that this Ordinance shall take effect twenty (20) days from the date of its adoption;

**AND BE IT FURTHER ORDAINED** that a fair summary of this ordinance shall forthwith be published twice in a newspaper having general circulation in the City and otherwise be made available to the public.

**INTRODUCED** by the City Council of the City of Hyattsville, Maryland, at a regular public meeting on November 19, 2018.

**ADOPTED** by the City Council of the City of Hyattsville, Maryland, at a regular public meeting on December 3, 2018.

Adopted: \_\_\_\_\_

Attest: \_\_\_\_\_  
Laura Reams, City Clerk

\_\_\_\_\_  
Candace B. Hollingsworth, Mayor

⌋ indicate deletions

Underline indicates additions

Asterisks \* \* \* Indicate matter retained in existing law but omitted herein

Effective Date: December 23, 2018





## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Ordinance

Agenda Section: Action Items (8:35 p.m. - 9:15 p.m.)

### SUBJECT

Adoption of Board of Supervisors of Elections Rules and Regulations (5 minutes)

### HCC-153-FY19

#### Recommendation:

I move that the Mayor and Council adopt the Board of Supervisors of Elections Rules and Regulations.

#### Sponsor(s):

At the Request of the City Administrator

#### Co-Sponsor(s):

N/A

#### ATTACHMENTS

[BOE Rules and Regulations\\_11.2.18.pdf](#)

#### Summary Background:

The Board of Supervisors of Elections Rules and Regulations were adopted by the Hyattsville City Council in 2012 and were in need of general updates in order to be compliant with the City's Election Code. Areas of the Code were determined to be more administrative in nature and were a better fit for the Rules and Regulations. An updated version of the Board of Supervisors of Elections Rules and Regulations is attached.

#### Next Steps:

The Board of Supervisors of Elections Rules and Regulations is scheduled for adoption on November 19, 2018. The document will be effective on the date of adoption.

#### Fiscal Impact:

N/A

#### City Administrator Comments:

Recommend Support

#### Community Engagement:

The City's Board of Supervisors of Elections and Ethics Commission previously provided their comments to the City Council for consideration and incorporation into the revised document.

#### Strategic Goals:

Goal 1 – Ensure Transparent and Accessible Governance

#### Legal Review Required?

Complete





**CITY OF HYATTSVILLE  
BOARD OF SUPERVISORS OF ELECTIONS  
RULES & REGULATIONS**

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## PART 1—BOARD OF SUPERVISORS OF ELECTIONS

### **Sec. 1.1 – The Board.**

(a) Composition. The Board of Supervisors of Elections (hereinafter the “Board”) shall consist of five (5) members who shall be appointed by the Mayor with the approval of the Council for a four (4) year term as set forth in § C4-2 of the City Charter.

(b) Qualifications. The members of the Board shall be qualified voters for City elections and shall not hold or be candidates for any other City office during their term. (Charter, §§ C4-1, C4-2).

(c) Oath. Prior to assuming the duties of office, each member of the Board shall take an oath before any officer of Maryland duly authorized to take an affidavit to the effect that they will obey the Constitution of the United States, the Constitution and laws of the State of Maryland, and the laws of the City of Hyattsville, and will fairly and impartially administer the duties of this office.

(d) Participation in Elections. Members of the Board and their designees must maintain an appearance of impartiality with respect to City electoral issues, and therefore, Board members are strictly prohibited from campaigning for any City candidate or referendum issue or otherwise participating in any City election other than voting and carrying out official duties. This prohibition includes contributing to any campaign or political committee, offering public support for any candidate or electoral issue, and/or engaging in any activity that might give the appearance of bias or partiality.

(e) Removal. The Council may remove any member of the Board for good cause provided that the Board member is given a written copy of the charges and an opportunity for a hearing before the Council. (Charter, § C4-3).

(f) Chairperson. The Board shall elect a Chairperson from among their members.

(g) Counsel. The City Attorney serves as counsel to the Board. The Board should seek advice from the City Attorney on all matters of law.

(h) Role of the City Clerk. The City Clerk shall coordinate communication between the Board and the City Council and between Board members and shall generally facilitate the conduct of City elections. The City Clerk shall also be the record-keeper for the Board.

### **Sec. 1.2 – Duties and Powers.**

(a) General. The Board shall be in charge of the conduct of all City elections and may appoint election judges or other employees to assist the Board. (Charter, § C4-4)

(b) Powers.

(1) The Board shall have all the powers described in § C4-4 of the City Charter and § 8-2 of Chapter 8 of the City Code.

(2) Additionally, the Board shall have the power to make and publish regulations regarding the conduct of City elections and make decisions on all disputes and controversies arising from the administration of the City election laws consistent with Article IV of the City Charter and Chapter 8 of the City Code.

**Sec. 1.3 – Meetings.**

(a) Quorum. For the exercise of its powers and duties, a majority of the members of the Board shall be sufficient for quorum and decision.

(b) Meetings. The Board shall meet at regular intervals and shall be authorized to hold such special meetings as the Board may require. Meetings will be called as needed by the Chairman or by the request of any other two members.

(c) Attendance of the City Clerk. The City Clerk, or their designee, shall attend all meetings of the Board.

(d) Notice of Meetings; Open Meetings Act. All Board meetings shall be publicly advertised and open to the public unless otherwise permitted by State law. The Board shall comply with the notice and other requirements of the Maryland Open Meetings Act.

(e) Rules. To the extent parliamentary guidance is required, and consistent with the City Charter and Code, the Board may use Roberts Rules of Order, Revised, during internal deliberations a guide.

(f) Minutes. Minutes of each meeting shall be kept by a person appointed by the Board. After the minutes are reduced to a writing, a copy shall be promptly forwarded to City Clerk who shall retain them consistent with the City's record retention policy.

**PART 2—ELECTION JUDGES**

**Sec. 2.1 – Election Judges.**

(a) Appointment. The Board must appoint such election judges as allowed by the City budget and as needed for the election.

(b) Removal. The Board must remove or replace any judge if in the Board's estimation such is necessary.

(c) Oath. Prior to assuming the duties of office, each judge shall take an oath before any officer duly authorized to take an affidavit, to the effect that the judge will obey the Constitution of the United States and the constitution and laws of the State of Maryland, and the laws of the City of Hyattsville, and will fairly and impartially administer the duties of the office.

## **Sec. 2.2 – Responsibilities.**

Judges shall assist the Board in the conduct of elections in the manner prescribed by the Board.

## **Sec. 2.3 – Training and Qualifications.**

The Board shall provide each judge with appropriate instructions and training prior to each general or special election and as otherwise required. Judges shall be thoroughly familiar with procedures for registration of voters, Vote-by-Mail ballot procedures, and candidate petition procedures. Judges shall be thoroughly familiar with operation of the polls on election days and such other matters relating to maintenance of the election days and such other matters relating to maintenance of the election rolls as may be pertinent to their assigned duties.

## **Sec. 2.4 – Compensation.**

Compensation of the Board members and judges of elections and expenditure for their duty shall be determined by the Council in the annual budget.

# **PART 3—QUALIFICATION AND REGISTRATION OF VOTERS**

## **Sec. 3.1 – Voter Qualifications.**

The qualifications of a voter are set forth in § C4-1 of the City Charter, which may be amended from time to time.

## **Sec. 3.2 – Registration Generally.**

(a) Generally. A person who is qualified to vote in a City election may register for the purposes of voting in a City election in one of two ways:

(1) By applying to become a registered voter of Prince George’s County; or

(2) By submitting an application on a form provided by the Board to be placed on the City Supplemental Voter Registry, which is maintained by the City Clerk.

(b) Proof of Identity, Age, and Residency. An applicant may prove identity, age, and residency for the purposes of registering for the City Supplemental Voter Registry as follows:

(1) Identity may be established through a valid photo identification card or document issued by a federal, state, or local government entity of the United States, any foreign

country, or any school, provided that the identification card or document contains, at minimum, a clear photo, the person's full name, and the name or identifying marks of the document's issuer.

(2) Age may be established through the identity documents set forth in Paragraph (1) of this Subsection if the documents include proof of the applicant's age, or through other documentation such as a birth certificate.

(3) Residency may be established through the identity documents set forth in Paragraph (1) of this Subsection if the documents include proof of residency, or through other documentation, including a copy of a deed, house or apartment lease, utility bill, paycheck, bank statement, school record, or other official or government document that shows the applicant's name and current address in the City.

(4) If the applicant is unable to provide sufficient documentary proof, the Board shall waive one or more of those requirements that the applicant produce documentation if the applicant provides an additional affidavit executed under the penalties of perjury, stating that the applicant does not currently possess documentation that could be used to prove identity, age, and/or residency. The affidavit shall be executed under the penalties of perjury and contain the following information:

(i) The applicant's name and residence address including street number,

(ii) A statement that the applicant meets the registration requirements of the City Charter to be a qualified voter in the City,

(iii) That the address on the application is the applicant's primary residence;

(iv) The applicant has lived in the City of Hyattsville for at least (30) days, and

(v) The applicant does not claim the right to vote elsewhere in the United States.

### **Sec. 3.3 – Same Day Registration.**

(a) Same Day Registration Permitted. A qualified voter who is not already registered with the City or County may register to vote on any City Election Day or Early Voting Day.

(b) Choice of Registry. Pursuant to Article III of Chapter 8 of the City Code, a voter may not remain registered in both the City Supplemental Voter Registry and the County election registry. In order to vote in a City election on the same day the voter registers, the applicant must be registered in the City Supplemental Voter Registry, at least temporarily for the purposes of that election. Applicants may then choose to remain registered in the City Supplemental Voter Registry only, or they may elect to have their application forwarded to the Prince George's County Board of Elections to apply for County registration. If the applicant chooses to have their application forwarded to the Prince George's County Board of Elections, pursuant to Subsection (e) of this

Section, the voter's name must be removed the City Supplemental Voter Registration upon verification that the voter application has been processed by the County.

(c) Procedure for Same Day Registration. Same day registration shall be conducted in accordance with the following procedures:

(1) Applicants shall be given a Prince George's County Board of Elections voter registration application or a City supplemental voter registration application.

(2) To register, the applicant must present a completed application and provide verification of identity, age, and residency per § C4-1 of the City Charter, § 8-9 of the Hyattsville City Code, and § 3.2 of these Regulations.

(3) The City Clerk or their designee shall then verify the following:

(i) review the application to ensure that all the necessary information has been provided and that it has been signed by the applicant;

(ii) verify that the applicant satisfies the age requirements

(iii) verify that the applicant's address is within City limits; and

(iv) check the City Supplemental Voter Registry and contact the Prince George's County Board of Elections to verify that the applicant is not registered in either voter database.

(4) If it is determined that the applicant is a qualified City voter and is not already a registered voter with either the City or County, the City Clerk or their designee shall:

(i) enter the applicant's registration information into the City Supplemental Voter Registry system;

(ii) issue the applicant a voter identification number;

(iii) prepare and issue a Same Day Voter Registration Voter Authority Card by completing the voter authority card, entering the voter identification number on the certificate, and having the voter sign the voter authority card; and

(iv) forward the application to the Prince George's County Board of Elections to be processed by the County Board if the applicant so desires.

(5) If it is determined that the applicant is not a qualified City voter, by reason of age, residence, or otherwise, the City Clerk or their designee:

(i) shall not register the voter in the City Supplemental Voter Registry;

(ii) shall promptly inform the applicant of the reason for rejection;



(iii) shall promptly inform the applicant that the voter is not permitted to vote in any City election until the voter becomes qualified and registered; and

(iv) may forward the application to the Prince George's County Board of Elections to be processed by the County Board if the applicant so desires.

(d) Authorization to Vote Same Day. An applicant who has been registered in the City Supplemental Voter Registry and issued a Same Day Voter Registration Voter Authority Card after completing the same day registration process as set forth in this Section may proceed to vote in that election.

(e) Post Same Day Registration Procedures. Within three business days after Election Day, the City Clerk or their designee shall forward all Prince George's County voter registration applications to the Prince George's County Board of Elections except those applications where the applicants opted to be registered in the City Supplemental Voter Registry only. Upon verification from the Prince George's County Board of Elections that voter registrations have been processed, the City Clerk or their designee shall remove the voter from the City Supplemental Voter Registry.

(f) In the event that a same day voter registration applicant's information cannot be verified, the applicant may cast a provisional ballot if otherwise eligible to do so.

### **Sec. 3.4 – Registration Lists.**

The Board shall annually obtain from the County Board an alphabetical list of County-registered voters who were shown as residing within the corporate boundaries of the City immediately prior to the period beginning thirty (30) days before each general and special election, which list shall be utilized as the registration roll of County-registered voters for purpose of a City election. The Board may also periodically request the County Board of Election Supervisors to provide the registration status of City residents on such occasions and in such form as the Board deems necessary. As required, the Board shall obtain a list of registered voters from the County Board, which may be utilized as the registration roll of County-registered voters for purposes of eligibility to sign a candidate petition under § C4-8 of the City Charter (see Part 4 of these Regulations). Such list is requested to be provided in two (2) formats: alphabetical (entire City) and by ward (street listing).

### **Sec. 3.5 – Reporting Voter Participation.**

The Board assists the County Board in maintaining its registration records by advising the County Board of the participation of voters in City elections. Such participation is credited by the County Board and ensures that no voter who has voted in a City election will be stricken from the County registration polls.

## PART 4—CANDIDATES FOR OFFICE AND PETITIONS

### **Sec. 4.1 – Candidate Applications.**

(a) Applications. Any qualified person desiring to be a candidate for an elective office shall file an application with the City Clerk on or before 5:00 p.m. on the last Friday in March in the year that the election is to be held for any elected position that will become vacant after the upcoming election. The application shall be on a form provided by the Board. No fee shall be charged for such filing. (Charter, § C4-8 and Code, § 8-6).

(b) Contents of Application. An application for candidacy shall be executed under oath and shall state:

- (1) That said candidate is a registered voter of the City;
- (2) That said candidate will be a resident of the City at the date of election;
- (3) The ward in which said candidate will reside on Election Day; and
- (4) The name of the office sought. (Charter, § C2-2(B) and Code, § 8-6).

(c) Reports Required. Each application for candidacy shall include a Financial Disclosure Statement pursuant to Chapter 10, § 10-9 of the City Code.

(d) Notice. The Board shall publicly announce the time and place by which candidates must formally file their applications as set forth in Subsection (a) of this Section. Notice of the availability of applications at the time and place for their filing shall be given twice in a newspaper of general circulation in the City once a week during the two (2) weeks preceding the filing deadline as well as on the City website and other publications. (Charter, § C4-8(B))

(e) Filing of Applications. When any application is received by the Board, the Board member or City Clerk will note the time and date of receipt in the upper right corner of the first page and initial under the time and date. All applications will be kept in a secure place until they are verified at a certification meeting.

### **Sec. 4.2 – Evaluation and Certification of Candidate Applications.**

As soon as reasonably practicable, the Board will meet and review each application to determine whether it conforms to the City's Charter and Code requirements. The qualifications of the prospective candidate shall be verified and the Board will certify to the Mayor and City Council the name of each person filing a verified application of candidacy and the respective office for which the person has filed. This certification shall be sent to the City Council at its first regular meeting following the last Friday in March of each election year.

### **Sec. 4.3 – Publication.**

The Board shall publicize within the City the names of certified candidates and the offices each candidate seeks, and shall post all such names and offices conspicuously at the polls.

#### **Sec. 4.4 – Candidate Notices.**

Prior to the opening of the polls on Election Day or the first Early Voting Day, each candidate is to be provided with a notice concerning candidate rights and responsibilities during the conduct of the election procedure. Such notice includes a statement in a form approved by the City Attorney describing restrictions on size and placement of signs, banners and other written messages.

#### **Sec. 4.5 – Certification of Petitions for Referenda and Ballot Initiatives.**

In the event the Board is called upon by the Mayor and City Council or the Charter to certify any petition, the Board shall meet as soon as reasonably practicable to verify the signatures on such petition using the following criteria:

(1) Only original signatures supporting a petition are valid. The Board shall not verify any signature on any petition or certify any petition unless the Board has received the original document with original signatures. Documents with petition signatures that are copied, scanned, or faxed (i.e., documents do not include the original signature) shall not be accepted by the Board as a timely filing or for any other purpose.

(2) Each person signing a petition shall indicate thereon their name, their address and ward. It is preferred that the person signing also print their name prior to signing to facilitate verification.

(3) No signature may be verified if it was obtained more than one (1) year prior to the date the petition is filed with the Clerk.

(4) A petition may consist of several pages, but each page shall contain the exact subject matter of the petition. At the bottom of each page of signatures shall be an affidavit of the person procuring the signatures on such page that to the best knowledge and belief of that person, every signature on the page is genuine and bona fide and that the signers are qualified voters of the City.

(5) The Board shall certify all petitions to the Mayor and City Council if they conform to the Charter or ordinances or regulations of the City. Whether or not the Board certifies a petition, it shall list the number of verified signatures, the total number of voters registered to vote at (or as close in time as practicable to) the time the petition was submitted to the Mayor and City Council, and the date used for counting the total number of registered voters in the City. When the Board fails to certify a petition, it shall notify the Mayor and City Council as soon as reasonably practicable.

(6) Petitions that require signatures of registered voters must have typewritten at the top of each signature page the purpose of the petition stated in such a manner as to define the issue at hand without confusion. The Board, in certifying such petitions, may comment to the Mayor and City Council on the adequacy of the language of the petition, the form of the petition, or any other matter regarding the petition. However, the Board cannot ordinarily withhold certification of a petition unless the number of verifiable signatures on the petition is inadequate,

the issue is not typewritten at the top of each page of the petition, or the petition lacks essential information necessary to verify signatures.

(7) In verifying signatures on a petition, the Board need not compare a signature sample of the registered voter with the signature on the petition. However, each signer of a petition shall sign their name as it appears on the election records of the City, and under each signature may be typed or printed each petitioner's name, address and ward. If the name of a petitioner is not identical to the name as it appears in the City's election records, the Board may certify the name if there is no reasonable doubt that the petitioner is the particular registered voter in question, and that all other requirements have been met.

*INTERPRETATION: As a general matter, a signature "A. Jones" will never suffice, and "Tony Jones" will ordinarily not suffice for "Anthony Jones." Further, the signature "John L. Smith, Jr." will not ordinarily suffice for "John L. Smith," or the signature "John L. Smith" for "John L. Smith, Jr.." Further, the signature "John Jones" will not suffice for "John L. Jones" because the name is so common, and the Board cannot be certain that no other person bearing that name lives in the City or at that address. However, a signature "Frank Carmane" may suffice for "Frank L. Carmane"—as well as the signature "Frank L. Carmane" for "Frank Carmane,"—but only if there are no other persons with that name within the City and all other information (address and ward) is identical to the City's election records and the Board has personal knowledge that no other person with a similar name lives at that address.*

(8) Regardless of whether the Board finds sufficient signatures on the petition to make it effective for the stated purpose, the Board shall keep locked in a secure place the original petition and shall not return the same to any petitioner. Working copies of such petition shall be copies made by the Board and certified by the Board or its authorized representative as a true and complete reproduction of the original petition.

## PART 5—ELECTIONS

### **Sec. 5.1 – Election Procedure, Generally.**

(a) Voting Days. Election Day and any Early Voting Days shall be scheduled pursuant to § C4-9 of the City Charter and Article II of Chapter 8 of the City Code.

(b) Wards. The Mayor shall be elected by the combined vote of all the wards of the City, and Ward Council members shall be elected by the votes of the wards in which they reside.

(c) Voting Machines. All City elections shall be conducted using mechanical or electronic machines or computers.

(d) Vote Count. Votes shall be counted and the winner of each contest or question shall be determined pursuant to § C4-11 of the City Charter.

## **Sec. 5.2 – Public Notice of Election.**

In all City elections, it shall be the duty of the Board of Elections to give public notice of the times, place and purpose thereof. (Charter, § C4-5). Such public notice shall be given on the City's website, on government access cable channel, in the City newsletter, in a newspaper of general circulation within the City and in the City's public notice board in the Municipal Building. Such public notice shall be given at least ten (10) days before the date of election. In the case of notice in a newspaper of general circulation in the City, notice shall be posted twice prior to the election. In the case of notice on the government access cable channel and the public notice board, such notice shall continue to be advertised until the date of the election. At the discretion of the Board, notices may also be posted in such public places in each ward in such manner as the Board may determine.

## **Sec. 5.3 – Candidate Rules.**

### **(a) Distance from Polls.**

(1) Candidates and persons campaigning for candidates, whether or not authorized to do so by the candidate, are required to remain at least 100 feet from the entrance door to any voting location when campaigning, greeting voters, or handing out materials. Candidates and persons campaigning for candidates may enter the building to use the rest rooms, to use a telephone for non-election purposes, and to go via the office corridor to get refreshments provided no contact is made with voters to promote any candidate or issue. Candidates and persons campaigning for candidates using the building shall not linger in the voting location.

### **(b) Pollwatchers.**

(1) Each candidate may designate by the appropriate form one (1) observer who shall be present in a polling place 5:00 p.m. the day prior to the election prior to the opening of the polls and may be present during the period of the election and thereafter until the results are tallied.

(2) The observer may not participate in or interfere with the conduct of the election in any way and, while in the polling place, must remain at a position designated by the Board. The observer must direct any questions or comments concerning conduct of the election to a Board member, and the Board member may require that the discussion be conducted outside the immediate polling place.

(3) A Board member may require the observer to leave the polling place for cause, including disruption of election activities and/or any attempt to influence the casting of a ballot.

## **Sec. 5.4 – Polls Opened and Closed; Attendance.**

(a) General. The polls shall be opened at 7:00 a.m. and closed at 8:00 p.m. on Election Day. The polls may be open at specified Early Voting Days prior to Election Day, as specified by the Board.

### **(b) Prior to Opening of Polls.**

(1) Prior to Election Day and any Early Voting Day, the Board and election judges should review the procedures for Election Day or Early Voting.

(2) All judges shall report to their designated polling place at least one (1) hour before the polls open, unless specifically authorized by the Board to report at a later time. Board members will report in at the City Building no later than 6:00 a.m.

(3) It is the policy of the Board that it shall only allow an absence of a judge or Board member in the case of an emergency.

(4) If any judge has not taken the required oath of office prior to this time, an authorized officer will administer it. The judge(s) will sign the certificate, which shall be filed with the City Clerk.

(c) Continuous Presence.

(1) No judge shall leave the polling place until it closes unless excused by the Board for valid reasons.

(2) No Board member or judge may leave the polling place until completion of the tally, unless excused by the Board for valid reasons.

**Sec. 5.5 – Inspection of Voting Machines.**

The chief judge shall conduct an appropriate inspection of each machine prior to the opening of the polls to determine that they are set up correctly and operating properly.

**Sec. 5.6 – Responsibility of Judges.**

(a) Judges. Judges will be assigned, as required in the judgment of the Board, to serve as poll book judges or voting machine judges (or both). The Board may change such assignments during the course of an election day as it may see fit.

(b) Responsibility of Chief Judges. A chief judge is responsible for:

(1) supervising other election judges;

(2) inspecting voting machines to ensure machines are operating correctly;

(3) ensuring proper order and election procedures are followed;

(4) ensuring that candidates, supporters of candidates, and others comply with the distance rule and refrain from electioneering in and near the polling place.

(c) Responsibility of Poll Book Judges. A poll book judge is responsible for:

(1) checking voter identification by requesting the voter's month and day of birth and checking the information declared by the voter against a relevant portion of the list of registered voters prepared for polling;



(2) assigning the voter a sequential number on a tally sheet;

(3) completing an authorization card for each registered voter who seeks to vote bearing the judge's initials and presenting the card to the voter; and

(4) making a record that the authorization card has been presented by putting a checkmark (✓) in the poll book next to the voter's name.

(d) Responsibility of Voting Machine Judges. The voting machine judge is responsible for:

(1) accepting the authorization card;

(2) directing the voter to the proper ward machine and, if necessary, aiding the voter in preparing or initializing the machine; and

(3) providing instruction to voters regarding the operation of the voting machine as necessary.

(4) The voting machine judge will enter the voting machine polling booth only for the purpose of explaining the functioning of the machine prior to the voter entering the polling booth to cast his/her ballot.

#### **Sec. 5.7 – Arrangement of Polling Places.**

Within the polling place, the area shall be divided as follows:

(1) A sample ballot display near the entrance to the polling place containing the names and ward designations of all duly certified candidates;

(2) A table for polling book judges, with responsibility divided on an alphabetical basis and signs prominently indicating this arrangement; and

(3) An area for one or more voting booths, as required.

#### **Sec. 5.8 – Voting Procedures.**

(a) Authorization.

(1) Upon entering the polling place, the voter shall approach the proper polling book desk which shows the first letter of the voter's surname and state the voter's name. The polling book judge should find the name in the registration list and shall ask the voter for their address (even if the voter is known to the judge).

(2) The polling book judge will check the voter's authorization card to ensure that the signature is as required and then initial the card on the line provided and present the card to the voter.

(b) Status Changes Not Reflected in Registration Books, Procedure on Election Day.

(1) *Voter moved within the City.* If a City voter has moved to a new address in the City, whether within a ward or from one ward to another ward, the voter may still vote from the voter's new address, provided all other voting requirements are met upon demonstration of convincing evidence of the change. The chief judge shall immediately call a Board member to ensure that the change is made on all appropriate records. The voter shall complete a change of address card. A copy of such card shall be provided to the County Board with the request that the County Board commence appropriate action under its own procedures.

(2) *Voter has moved into the City.* A voter registered with the County Board who has moved from a residence elsewhere in the County to a residence in the City may vote in the City election with a provisional ballot.

(3) *Change of name by marriage or decree.* In the event an otherwise qualified registered voter presents themselves by a name other than that shown on the voting rolls on account of a change of the voter's name by marriage or court decree (or other means sufficient under the laws of the pertinent jurisdiction), the poll book and/or chief judge shall refer the voter to a Board member. The voter shall be instructed to take action appropriate to correct the registration maintained by either the Prince George's Board of Election Supervisors or the City Supplemental Voter Registry, whichever is applicable.

(4) *Disqualifying condition.* If an allegation is lodged on Election Day that a voter is not currently qualified to vote because of guardianship for mental disability or other cause, the voter denies such disqualifying condition, and the Board has no personal knowledge of the disqualifying condition, the voter is permitted to vote unless the person alleging such disqualification presents a certified true copy of the judgment or order giving rise to such disqualification.

(5) *Voter Purged from Registration.* If the voter has been purged for any reason and the voter claims this is erroneous, the judge will ask a Board member to have the applicant voter execute a provisional ballot application. The voter may then vote with a provisional ballot.

(c) Voting.

(1) Voter will form a line approaching the polling booths, if necessary, and shall, in turn, present their authorization cards to the voting machine judge. The judge will set the machine, if necessary, as the voter approaches the machine. The voter shall then approach and/or enter the polling booth enclosure and make ballot selections.

(2) The voting machine judge will retain the authorization cards until they are presented to the Board.

(3) The voter must make ballot selections at or in a voting booth alone, except that a parent or guardian may be accompanied by children not more than seven (7) years of age. If a

voter, because of infirmity, blindness or unfamiliarity with the voting machine shall need and request assistance, they will be provided with an affidavit of assistance form or audio assist.

(d) Periodic Checks. If voting machines are used, periodically during the day, the Board will check voter tally sheets against authorization cards and the voting machine counters to ensure that proper recording and documentation of vote action.

#### **Sec. 5.9 – Vote-by-Mail Voting.**

(a) Generally. Vote-by-Mail voting shall be conducted in strict conformity with Article V of the City Code.

##### **(b) Applications.**

(1) Applications for Vote-by-Mail ballots may be obtained from the City Clerk, the Board, or the City website. Requests may be made by mail, telephone, or in person. Copies will be kept in the files of the Board.

(2) Clerks and Board members receiving applications for Vote-by-Mail ballots shall enter the date and time of receipt of such applications on the upper right-hand corner of the application, together with the initials of the person accepting receipt. (If a time stamp is used, the stamp is endorsed with the initials of the person accepting receipt).

##### **(c) Processing of Applications.**

(1) Vote-by-Mail ballot applications shall be promptly placed in a secure cabinet or file pending review by the Board. Delivery will be made to the Board as soon as possible by the City Clerk.

(2) Pursuant to § 8-16 of Chapter 8 of the City Code, the Board shall review the applications regularly to determine that the application is from a registered voter and, if so, that the application is correctly and completely executed and no known impediment exists to the voter's eligibility.

(d) Application Rejected. If an application is rejected, the Board must notify the applicant, in writing and by phone, of the reasons. The notice will be sent within 24 hours of the Board decision. A full record of each such action will be kept for one year in the file folder for the particular election in the Board's files.

(e) Application Approved. If an application is approved, the Board shall update the precinct and Vote-By-Mail binders and other registers accordingly.

(f) Restrictions on Vote-by-Mail Ballots. No more than one (1) Vote-by-Mail ballot shall be mailed or delivered to any one applicant unless the Board has reasonable grounds to believe that the Vote-by-Mail ballot previously mailed has been lost, stolen, destroyed or spoiled. When a voter designates an agent to pick up or to return a ballot, neither the Mayor, a Councilmember, a candidate for such office, an individual working for a candidate, nor any member of their

immediate families may serve as such agent. A Board member may pick up or drop off applications or ballots when need requires it.

(g) Receipt of Ballot; Handling. The Clerk or Board member receiving a Vote-by-Mail ballot shall note date and time of receipt and initial on the left front of the envelope. (If a date stamp is used, the stamp is endorsed with the initials of the person accepting receipt). The envelope shall not be opened by anyone until the time for canvassing. All ballots received prior to the closing of the polls will be placed in a secure file. Ballots received at the City Office will be delivered to the custody of a Board member or the Clerk as soon as practicable. The name of the person doing this will be entered in the register described below.

(h) Election Day. On Election Day, the Board will maintain all Vote-by-Mail ballots in a separate secure file box with the register and related poll book cards, until the polls close. Any Vote-by-Mail ballot, including any emergency Vote-by-Mail ballot, received after the time of closing of the polling place on Election Day shall not be counted.

(i) Register. The Board will maintain a register of applications for Vote-by-Mail ballots in which applications shall be entered chronologically by receipt. A separate line entry will be made for each application and will be extended to show final disposition of the application and the sending and return of the ballot. Items to be recorded are as follows:

(1) *Application received*. The Board shall enter the following items after resolving any discrepancies between the application and the information on the registration books:

- (i) Applicant's name;
- (ii) Applicant's address (street, number, apartment number);
- (iii) Applicant's ward; and
- (iv) Date and time received by Board or City Office.

(2) *Board action*. Check under "Approved" or "Disapproved" and enter date of action. (See Sec. 5.9(c) for procedures on processing of application).

(3) *Ballot package sent*. Enter date, time and method of sending the absentee ballot package to the applicant.

(4) *Ballot received back*. Enter date and time of receipt and method of delivery and to whom delivered (Clerk at City Office, Board member).

(5) *Securement of ballot*. Upon receipt, the Board member secures the ballot (with envelopes unopened).

### **Sec. 5.10 – Canvassing and Reporting Election Results.**

(a) Generally. Immediately upon closing of the polls, the judges of the election shall proceed to count the ballots. The counting of the ballots or checking of the votes on voting machines shall be announced publicly.

(b) Ballots Not Counted. No ballot cast by a voter dwelling in one ward for a candidate for the office of Councilmember of another ward, and no ballot cast for more than one candidate for the office of Mayor, shall be counted.

(c) Written Returns. The Board shall prepare written returns of the vote counts fully completed with the names of the judges and Board signed thereon. One (1) copy of such returns shall be sent to the City Clerk for filing among the records of the City.

(d) Dissenting Judge. Any judge or member of the Board who declines to sign said return shall immediately prepare, sign, and seal in an envelope and send as aforesaid an individual return, giving their reasons therefor.

(e) Sealing of Voting Information. Upon completion of the tabulation of the votes cast, the voting machines shall be sealed as provided by law for general elections of state and county officials. There shall be no postponement or adjournment of the above actions until they are completed. The voting cartridges, if any, shall then be retained by the Board for a period of thirty (30) days, exclusive of Sundays and legal holidays, provided, however, that if there be a contest of the election, said cartridge shall not be destroyed or unsealed until after the decision of the Circuit Court for Prince George's County.

### **Sec. 5.11 – Eligibility to Serve.**

The Charter does not confer upon the Board the power or responsibility for determining whether a successful candidate is qualified to serve (as distinct from determining whether a candidate is qualified to stand for election at the time a petition is filed). Therefore, the Board certifies elected candidates based exclusively upon the votes cast by registered voters qualified to vote. Certification is without prejudice to the jurisdiction of any other appropriate body or court to ascertain the eligibility of the successful candidate to serve in the capacity to which the individual was elected.

## **PART 6—COMPLAINTS**

### **Sec. 6.1 – Complaints, Generally.**

All disputes as to election results or any of the policies and procedures set forth in Chapter 8 of the City Code or these Regulations shall be governed by Article VIII of Chapter 8 of the City Code and the rules and regulations set forth in this Part.

## **Sec. 6.2 – Procedure for Filing Complaints.**

### **(a) Eligibility to File a Complaint.**

(1) Any applicant whose application or certification pursuant to Chapter 8 of the City Code has been denied by the Board;

(2) Any person who is a qualified voter of the City and believes that a violation of Chapter 8 of the City Code or a provision of the City Charter related to an election matter has occurred, except for those set forth in Paragraph (1) of this Subsection, which must be filed by the person whose application or certification was denied.

### **(b) Time for Filing a Complaint.**

(1) A complaint regarding denial of certification of candidacy must be filed within seven (7) days of the Board's decision on certification.

(2) All other complaints must be filed within one hundred eighty (180) days from the date that the alleged violation was discovered or reasonably could have been discovered with the exercise of due diligence, but in no case may a complaint be filed more than one hundred eighty (180) days after the election to which the alleged violation pertains.

### **(c) Contents of Complaint. Complaints shall include:**

(1) a reasonably detailed explanation of the allegation(s);

(2) supporting documentation if necessary; and

(3) the name, address, and signature of the complaining party.

## **Sec. 6.3 – Initial Review of Complaint by Board.**

(a) Initial Review. Upon the filing of any complaint, the Board shall conduct an appropriate investigation to ascertain whether there are reasonable grounds to believe the allegation is true.

(b) Assistance. The Board may request the assistance of the City Clerk and/or other City employees in this investigation.

### **(c) Post-Investigation Procedure.**

(1) If, after conducting a reasonable investigation of a complaint, the Board determines there are no reasonable grounds to believe that the allegations in the complaint are true, the Board shall issue a written order dismissing the complaint.

(2) If, after conducting a reasonable investigation of a complaint, the Board determines that there are reasonable grounds to believe that the allegations in the complaint are true, the Board or its designee shall attempt to conciliate the matter by methods of initial



conference and persuasion with all interested parties and such representative as the parties may choose to assist them.

(3) If a complaint is conciliated, the terms of the conciliation agreed to by the parties may be reduced to writing and incorporated into a consent agreement as needed.

(4) If a complaint is not conciliated after the Board concludes that there are reasonable grounds to believe the complaint is true, the Board shall conduct one or more hearings as set forth in this Article.

#### **Sec. 6.4 – Conduct of Hearing by Board.**

##### **(a) General Procedure.**

(1) If a complaint is not dismissed or conciliated as set forth in Sec. 6.3 of these Regulations, the Board shall:

(i) serve upon the person against whom the complaint has been filed (designated as the “respondent”), if any, a summons and statement of charges;

(ii) schedule and hold one or more hearings;

(iii) serve upon all interested parties a copy of the statement of charges and notice of the time and place of hearings; and

(iv) promptly inform the City Clerk of the time and place of any hearing.

(2) Hearings shall be held not less than seven (7) days and not more than thirty (30) days after service of the statement of charges and summons, unless the Board determines that emergency circumstances require an earlier hearing.

(3) Hearings conducted by the Board shall be open to the public.

(4) Notwithstanding paragraph (3) of this Subsection, the Board may conduct a closed hearing if:

(i) one of the parties submits a written request;

(ii) the Board finds a compelling reason to conduct a closed hearing; and

(iii) closing the hearing to the public is not otherwise prohibited by State law.

(5) The parties or their representatives may file statements prior to any hearing and present testimony and evidence at hearings.

(6) Any testimony given shall be under oath or affirmation.

##### **(b) Summons, Appearance, and Representation.**

(1) Any summons to a hearing held pursuant to this Section must be signed by the chairperson of the Board or their designee and shall require the attendance of named persons and/or the production of relevant documents and records.

(2) The parties may, at their option, appear before the Board in person or by one or more duly authorized representatives and may have the assistance of an attorney.

(3) Unless otherwise provided, the City Attorney shall advise the Board during the administrative review of any complaint.

#### **Sec. 6.5 – Deliberation and Decision by Board.**

(a) Deliberation. After all necessary hearings are conducted, the Board shall deliberate and make a determination as to alleged violations of the elections provisions of the Charter or City Code or related disputes within its authority.

(b) Confidentiality. The deliberations of the Board shall not be public.

(c) Disposition and Orders.

(1) If, after deliberation, the Board determines, upon the preponderance of the evidence of record, that the respondent has not violated Chapter 8 of the City Code or any applicable election law, or that the complainant is not entitled to relief, the Board shall state and publish its findings and issue an order dismissing the complaint.

(2) If, after deliberation, the Board determines, upon the preponderance of the evidence of the record, that the respondent has violated Chapter 8 of the City Code or any applicable election law, or that the complainant is entitled to relief, the Board shall state and publish its findings and issue an order requiring any party to cease and desist conduct in violation of this Chapter or other applicable election laws and/or granting any appropriate relief as permitted by Article IX of Chapter 8.

#### **Sec. 6.6 – Records.**

The Board shall keep a full record of all hearings, decisions, and other records relevant to any review conducted under this Section which shall be transmitted to the City Clerk and retained pursuant to the City's record retention policy.

**ADOPTED** by the City Council of the City of Hyattsville, Maryland, at a regular public meeting on November 19, 2018.

Adopted: \_\_\_\_\_

Attest: \_\_\_\_\_  
Laura Reams, City Clerk

\_\_\_\_\_  
Candace B. Hollingsworth, Mayor

\_\_\_\_\_  
Greta Mosher, Chair  
Board of Supervisors of Elections

{ } indicate deletions

Underline indicates additions

Asterisks \* \* \* Indicate matter retained in existing law but omitted herein

Effective Date: November 19, 2018



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Hal Metzler

Submitting Department: Public Works

Item Type: Contract

Agenda Section: Action Items (8:35 p.m. - 9:15 p.m.)

### SUBJECT

3505 Hamilton Street Renovation Project - Architectural and Engineering Design Change Order (10 minutes)

### HCC-114-FY19

#### Recommendation:

I move that the Mayor and Council authorize a change order not to exceed \$160,000 in the Johnson, Mirmiran, and Thompson (JMT) contract to cover additional redesign and engineering work at 3505 Hamilton Street and the amount is currently covered under contingency cost within the previously approved \$10,265,000 capital budget appropriations for this project.

#### Sponsor(s):

At the Request of the City Administrator

#### Co-Sponsor(s):

N/A

### ATTACHMENTS

[TO01A Change OrderProposal 1 Rev 3 08Oct2018.pdf](#)

#### Summary Background:

In May 2017, the Council approved moving forward with the design and renovation of 3505 Hamilton Street to be the new Hyattsville City Police Station. JMT was issued a purchase order for architectural and engineering design work. As the design progressed, some of the needs of the City and Police Department necessitated revisions to the plans to ensure all services could be adequately provided while minimizing construction costs. As a result, a change order has been submitted by JMT to cover the cost of approved architectural and engineering changes. The administration is seeking approval of a change order in the amount of \$160,000 and this amount is currently covered under contingency cost within the previously approved \$10,265,000 capital budget appropriations for this project. The revised budget for Architect and Engineering Services is now \$1,139,390.

#### Next Steps:

N/A

#### Fiscal Impact:

The \$160,000 change order revises the Architect and Engineering Services budget to \$1,139,390.

#### City Administrator Comments:

Recommend Approval

#### Community Engagement:

N/A

#### Strategic Goals:

### Goal 3 – Promote a Safe and Vibrant Community

#### **Legal Review Required?**

N/A



October 8, 2018

Mr. Hal Metzler, Jr.  
City of Hyattsville  
4310 Gallatin Street  
Hyattsville, MD 20781

Re: Proposed Change Order No. 1 for Professional Consulting Services  
City of Hyattsville Police Headquarters Re-location, 3505 Hamilton Street  
Project DPW07132015 / JMT #16-1916-01A

Dear Mr. Metzler,

JOHNSON, MIRMIRAN & THOMPSON is providing our proposed Change Order # 1 to complete the design of the Police Headquarters re-location. During the design development and construction document phases there were multiple revisions increasing the scope of work of the project. The break-down of additional services and the associated costs have been grouped in two categories below. Category One (1) addresses the multiple modifications (scope additions) reviewed and approved by the City after the completion and submission of the 60% design development drawings requiring architectural and engineering rework. Category Two (2) identifies additional revisions during the preparation of 95% construction documents which lead to significant mechanical, electrical and plumbing (MEP) revisions described below.

Below is the list of the multiple items requiring additional efforts to complete design. The scope has been identified at the design discipline level:

#### **CATEGORY ONE**

**Multiple Design Revisions:** (scope additions approved by Hyattsville Administration per City's Procurement Office on May 9, 2018)

- **Architectural**

- Multiple iterations of the Communications /Records area ultimately requiring multiple site visits to mock-up full size layouts at the City's request before operational floor plan was finally determined.
- Redesign of Evidence Processing Area and Basement Break Area; City programming changes late in design

- **Mechanical, Electrical, and Plumbing**

- Modifications of the Records and Communications area
- Redesigning and recalculating airflow the Evidence Processing area
- Modification of second floor unfinished space above Sallyport
- Relocating the FATS training equipment to second floor of the Sallyport

#### **CATEGORY TWO**

**Additional Scope Changes:**

- **Architectural / Structural**

- Investigate removal and elimination of existing column in future community room and incorporate structural design modifications

- **Civil**
  - o Additional landscape design for creation of front plaza to complement new entry ramp schemes
- **Mechanical, Electrical, and Plumbing**
  - o Recalculate generator capacity per City's interior space additions and usage plan, and addition of battery chargers for electric vehicles
  - o MEP modifications, especially heating, fresh air ventilation, and air conditioning (HVAC), had to wait until the architectural plans rework and city changes were final (i.e. walls modified, quantity of people/desks were determined in each space, etc.) to move forward with the design changes. This work included:
    - Recalculate power load calculations for final revised building interior layout
    - Determine new HVAC systems capacities and modify specification language
    - Coordinate low voltage security, emergency and radio communication and information technology with City selected vendors, after manufacture's systems design were completed
    - Remove windows below grade at City's request
    - Reprogram heating, fresh air ventilation, and air conditioning control sequences design
    - Ductwork and controls devices to be reconfigured including, and Training Room (B26) which was converted to an open ceiling design
    - Redesign plumbing and fire protection systems due to room size and tenant use changes
    - Lighting and power receptacles layouts redesigned due to room size and tenant use change
- **Post Abatement Driven Design Changes:**
  - o Additional site visits to record the data that was categorized under "Hidden Conditions"
  - o Rework demolition plans completed earlier in the design process
  - o Architectural, mechanical, electrical, plumbing (A/E & MEP) modifications desired as a result unforeseen conditions discovered after hazardous material abatement

#### **CATEGORIES 1 and 2**

**Total Amount Not to Exceed**

**\$159,295.00**

#### **Assumptions:**

- a. City will provide bid phase services including but not limited to advertise, receive and process general contractor bids and award
- b. Bid Phase project management services are not included
- c. Any regulatory agency fees required are excluded
- d. Project management, daily inspection, reporting and all other services during construction are not included. Project Management Services will be provided under separate proposal
- e. Third party "building" inspection fees, and commissioning are not included and will be provided under separate proposal

Thank you for using JOHNSON, MIRMIRAN & THOMPSON to provide these services.

Very truly yours,  
JOHNSON, MIRMIRAN & THOMPSON

*Jeff S. Burkhardt*

Jeff Burkhardt, CCM, CQM  
Senior Associate

cc: Jon Ryan, JMT  
John DiMenna, JMT  
Soli Guille, JMT



City of Hyattsville  
Relocation of Police Headquarters  
3505 Hamilton Street  
Design Development Review of City Comments  
16 May 2018

WARNING NOTE THE FOLLOWING IS CRITICAL AS IT IMPACTS ACTUAL MEP DESIGN COST

No matter what changes are made, we'll have to reperform MEP calculations for the loads throughout the zones that are affected. Whichever changes are chosen will also affect the associated system selection. There's no way to truly capture all of this in percentages, but costs below is the breakdown for each of the areas as best that can be determined at this time based on discussion only; no drawings available.

|      |                                                                                                                                                                                               |                                                                                                                                                   |                                                                                                                                                                     | Redesign Impacts:     | Construction Impacts: |                       |                                                  |                             |                    |                                                                                         |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|--------------------------------------------------|-----------------------------|--------------------|-----------------------------------------------------------------------------------------|
| Item | Requested Change                                                                                                                                                                              | Narrative                                                                                                                                         | Possible and Realistic                                                                                                                                              | Time Extension (est.) | Time Extension (est.) | City Approval         | Approval By                                      | Approval Date               | City Justification |                                                                                         |
| 1    | Basement Plan:<br>(Affecting Tech Services, Storage & Lieut. Office)                                                                                                                          | Reconfiguration of floor plan affecting three offices to incorporate an access corridor. NOTE: (Option 1 is dependent on acceptance of Option 10) | Yes                                                                                                                                                                 | 4 weeks               |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Training- See item 10, new specialized training equipment requires larger training area |
| 2    | Sallyport:                                                                                                                                                                                    | Division of the two bays with CMU wall with overhead coiling doors and coiling counter doors to decrease change of contamination to evidence bay. | Yes                                                                                                                                                                 | 4 weeks               |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Operational Process, Productivity and Safety out way costs                              |
| 3    | Canine:                                                                                                                                                                                       | Move canine wash to Sallyport support and add two exterior doors to the dog runs.                                                                 | Yes                                                                                                                                                                 | 4 weeks               |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Operational Process, Productivity and Safety out way costs                              |
| 4    | Communication/Records:<br>(adding another office)                                                                                                                                             | Add an additional office.                                                                                                                         | (*) Dividing the existing office space into three sections rather than two by adding a wall can work. Optional drawings are being produced. Require quick approval. | 6-8 weeks             |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Operational Process, Productivity and Safety out way costs                              |
| 5    | Evidence Processing:<br>(a complete reconfiguration)                                                                                                                                          | Reconfiguration of the entire suite.                                                                                                              | (*) City requested changes were misunderstood. Collaborative redesign ongoing                                                                                       | 6-8 weeks             |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Operational Process, Productivity and Safety out way costs                              |
| 6    | Evidence Storage:<br>(adding an office for two workstations)                                                                                                                                  | (*) Provide for two workstations in drop-off area adjacent to Evidence Processing.                                                                | (*) City requested changes were misunderstood. Collaborative redesign ongoing                                                                                       | 4 weeks               |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Operational Process, Productivity and Safety out way costs                              |
| 7    | Reconfiguring 3 Sargent offices:<br>(west side of second floor)                                                                                                                               | Reconfigure space to achieve a Lieutenant's office and a Patrol Office.                                                                           | Yes                                                                                                                                                                 | 4 weeks               |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Operational Process, Productivity and Safety out way costs                              |
| 8    | Reconfiguring Sargent offices, Lieutenant offices and Patrol Traffic: (east side of second floor)                                                                                             | Reconfigure space to achieve five equal size offices.                                                                                             | Yes                                                                                                                                                                 | 4 weeks               |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Operational Process, Productivity and Safety out way costs                              |
| 9    | Relocating the Chief's toilet room:                                                                                                                                                           | (*)Provide natural light into Administrative Assistant's area. Discussed light tube or fiber optic                                                | Yes                                                                                                                                                                 | 4 weeks               |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Operational Process, Productivity and Safety out way costs                              |
| 10   | Incorporating third floor "future" space as an ADD Alternate for FATS. Basement floor plan would correspondingly reconfigured to move video servers from Storage into the current FATS space. | Enclose roof space to achieve additional third floor area for FATS in lieu of basement location.                                                  | Yes                                                                                                                                                                 | 2 weeks               |                       | NO SIGNIFICANT IMPACT | Verbal agreement L Rittle DPW & Chief D. Holland | Confirmed in writing by JSB | 16-May-2018        | Specialized Training - Updates equipment required larger training area                  |

|                                                                         |                               |                        |                           |                |
|-------------------------------------------------------------------------|-------------------------------|------------------------|---------------------------|----------------|
| Johnson, Mirmiran & Thompson                                            |                               |                        |                           |                |
| COST SUMMARY FORMAT                                                     |                               |                        |                           |                |
| PART I - GENERAL                                                        |                               |                        |                           |                |
| CLIENT: City of Hyattsville - Professional Consulting & Design Services | Hyattsville Police Relocation |                        | DPW07132015               | Task Order 01A |
| CONSULTANT: Johnson, Mirmiran & Thompson                                | JMT -16-1916-01a              |                        | PROPOSAL DATE<br>8-Oct-18 |                |
| ADDRESS: 601 New Jersey Ave, Suite 210 Washington, DC 20001             |                               |                        |                           |                |
| COST SUMMARY                                                            |                               |                        |                           |                |
| 1. DIRECT LABOR (Specify labor categories)                              | HOURS                         | HOURLY RATE            | ESTIMATED COST            | TOTALS         |
| Program Manager                                                         | 0                             | \$145.00               | \$ -                      |                |
| Senior Architect                                                        | 125                           | \$180.00               | \$ 22,500.00              |                |
| Architectural Designer                                                  | 125                           | \$115.00               | \$ 14,375.00              |                |
| Senior Engineer                                                         | 40                            | \$180.00               | \$ 7,200.00               |                |
| Engineer                                                                | 160                           | \$115.00               | \$ 18,400.00              |                |
| CADD Techican                                                           | 148                           | \$90.00                | \$ 13,320.00              |                |
| Civil                                                                   | 200                           | \$145.00               | \$ 29,000.00              |                |
| Construction Project Manager                                            | 300                           | \$115.00               | \$ 34,500.00              |                |
| Total Hours                                                             | 1,098                         |                        |                           |                |
| DIRECT LABOR SUBTOTAL:                                                  |                               |                        | \$ 139,295.00             |                |
| 2. INDIRECT COSTS (Specify)                                             | RATE                          | X DIRECT LABOR TOTAL = | ESTIMATED                 |                |
| OVERHEAD AND PAYROLL BURDEN                                             | 0%                            |                        | \$ -                      |                |
| INDIRECT COSTS SUBTOTAL                                                 |                               |                        | \$ -                      |                |
| 3. TOTAL OF DIRECT LABOR & INDIRECT COSTS (Combined Sum of Items 1 & 2) |                               |                        |                           | \$ 139,295.00  |
| 4. PROFIT - (Fixed Hourly Rate)                                         |                               |                        |                           | \$ -           |
| 5. TOTAL PROFESSIONAL FEE (Combined Sum of Items 3 & 4)                 |                               |                        |                           | \$ 139,295.00  |
| 6. OTHER DIRECT COSTS (refer to attached itemization)                   |                               |                        |                           |                |
| 7. EXPENSES                                                             | QTY.                          | COST                   | ESTIMATED COST            |                |
| a. Transportation (personal car)                                        |                               | \$ 0.54                | \$ -                      |                |
| b. Photocopies (Outside Copying)                                        | 0                             | sheets X \$0.10/sheet  | \$ -                      |                |
| c. Drawing Prints                                                       | 0                             | sheets X \$1/sheet     | \$ -                      |                |
| EXPENSES SUBTOTAL                                                       |                               |                        | \$ -                      |                |
| 8. EQUIPMENT, MATERIALS, SUPPLIES (See attached itemization)            | QTY.                          | COST                   | ESTIMATED COST            |                |
|                                                                         |                               |                        | \$ -                      |                |
|                                                                         |                               |                        | \$ -                      |                |
| EQUIPMENT SUBTOTAL:                                                     |                               |                        | \$ -                      |                |
| 9. SUBCONSULTANT(S)                                                     |                               |                        | ESTIMATED COST            |                |
| a. Columbia Engineering, Inc.                                           | 1                             | \$ 15,000.00           | \$ 15,000.00              |                |
| b. Moyer Associates                                                     | 1                             | \$ 5,000.00            | \$ 5,000.00               |                |
| SUBCONSULTANT(S) - SUBTOTAL:                                            |                               |                        | \$ 20,000.00              |                |
| 10. SUBCONSULANT MARKUP                                                 |                               |                        | ESTIMATED COST            |                |
| a. NA Services Provided by JMT                                          |                               | 0.10                   | \$ -                      |                |
| SUBCONSULTANT(S) - SUBTOTAL:                                            |                               |                        | \$ -                      |                |
| OTHER SUBTOTAL                                                          |                               |                        | \$ -                      |                |
| OTHER DIRECT COSTS TOTAL: (Combined Sum of Items 7, 8, 9, 10)           |                               |                        |                           | \$ 20,000.00   |
| TOTAL PRICE (Combined Sum of Items 5 & 10)                              |                               |                        |                           | \$ 159,295.00  |



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Katie Gerbes

Submitting Department: Community & Economic Development

Item Type: Planning & Development

Agenda Section: Discussion Items (9:15 p.m. - 9:45 p.m.)

### SUBJECT

Hyattsville Transportation Study (15 minutes)

**HCC-146-FY19**

### Recommendation:

### Sponsor(s):

At the Request of the City Administrator

### Co-Sponsor(s):

N/A

### ATTACHMENTS

[Transportation Study Adoption Memo.docx](#)

[Hyattsville Comments on Final Report\\_TDG Response.xlsx](#)

[Draft Final Report HVL Clean\\_revised 092018.pdf](#)

[Appendix A: Hyattsville Transportation Study - Existing Conditions Memo](#)

[Appendix B: 2037 AM\\_Build](#)

[Appendix B: 2037 AM\\_No Build](#)

[Appendix B: 2037 PM\\_Build](#)

[Appendix B: 2037 PM\\_No Build](#)

[Appendix C: Wayfinding Submittal](#)

[Appendix D: Hyattsville TS Planning Level Cost Estimate](#)

[2018-09-26\\_Final Report Presentation to City Council.pdf](#)

[Transportation\\_Study\\_Council\\_Meeting\\_comments\\_FINAL \(1\).docx](#)

### Summary Background:

On October 1, 2018, the final draft of the Hyattsville Transportation Study was presented to the City Council and Hyattsville community. Comments on the final draft were accepted throughout the month of October. Along with 175

the report, the City Council will be presented with the list of comments collected by residents and staff during the October review period.

The adopted Hyattsville Transportation Study will serve as the City's transportation policy and action plan for the foreseeable future, there staff is recommending that any City Council directed amendments to the document be made via the adoption of a Council motion.

**Next Steps:**

The finalized version of the study will incorporate revisions directed by the City Council and be presented for adoption on December 3, 2018. Once adopted the final document will be published on the City's website.

**Fiscal Impact:**

N/A

**City Administrator Comments:**

Recommend Support

**Community Engagement:**

Community Sustainability Plan - Goal 9: Improve Traffic Flow within Neighborhoods.

There were several rounds of public meetings held to gather resident feedback to inform the Hyattsville Transportation Study. A total of seven (7) meetings were held, as well as online Wikimaps and pages on the Speak Up site were created in order to further gather community input. Additionally, the final draft of the study was uploaded to Speak Up for resident review and comment from October 1 - October 29.

**Strategic Goals:**

Goal 3 – Promote a Safe and Vibrant Community

**Legal Review Required?**

N/A



## Memo

To: Mayor and City Council

CC: Tracey Nicholson, City Administrator  
Lesley Riddle, Director, Department of Public Works  
Hal Metzler, Project Manager, Department of Public Works

From: Katie Gerbes, Community Planner

Date: November 13, 2018

Re: Hyattsville Transportation Study – Final Report

Attachments: Hyattsville Transportation Study  
Appendix A: Technical Memorandum I: Existing Conditions Report  
Appendix B: Technical Memorandum II: Future Conditions Results  
Appendix C: Wayfinding Report  
Appendix D: Planning-Level Cost Estimate  
Hyattsville Transportation Study Comment Spreadsheet  
Hyattsville Transportation Study November 5 Comments

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The purpose of this memorandum is to provide the Mayor and members of the City Council with information on the final draft of the Hyattsville Transportation Study.

### Project Summary

In July 2017, the City retained the services of Toole Design Group to perform a city-wide Transportation Study. The project kicked off in Fall 2017 by gathering community input on transportation related concerns within the City. In March 2018, Toole presented an Existing Condition Report, which provided a review of past studies; a summary of data collection and assessment; the Wikimap summary; school area circulation observations; existing motor vehicle traffic conditions and the origin-destination analysis. In May 2018, Staff published a list of draft recommendations on the Speak Up website, allowing residents an opportunity to review some of the proposed changes and provide comments on them. The comment period for the draft recommendations closed in June 2018.

From all of the feedback throughout this process, Toole has provided the City with the final draft of the Hyattsville Transportation Study. The study itself is divided into eight (8) sections, including the current state of transportation in Hyattsville, major transportation findings, future transportation needs, the proposed transportation network and implementation strategies. The study also has four (4) appendices with additional information and data.

#### Proposed Changes & Staff Recommendations

After the study was presented to the community at the City Council meeting on October 1, 2018, a page was activated on the Speak Up site where the document and its associated appendices are available for the general public to review and provide comment. The Speak Up page was live through October 29, 2018. During the review period, Staff also review the final draft of the report for any necessary edits.

During the November 5 meeting, Staff presented the City Council with a spreadsheet listing every comment received during the review period. Following each comment, there are columns listed for Staff's opinion on the comment, as well as Toole Design Group's opinion on the comment.

At the last meeting, the Council directed staff to perform further analysis on nine different recommendations in the plan, or recommendations submitted by residents. That analysis is provided as an attachment to this memo. Staff request that the City Council make a determination on the inclusion and/or removal of each of the nine recommendations at the November 19 meeting.

#### Next Steps

The Hyattsville Transportation Study is on the "Discussion" agenda for the November 19, 2018 City Council meeting. At this meeting, Staff will be seeking direction from the City Council on what comments/edits should be incorporated into the study. The Hyattsville Transportation Study will be brought back to the City Council once again on December 3, 2018 for adoption. Upon adoption of the document, the recommended changes will be made, and the document is anticipated to be published on the City's website in mid December.

| Date      | Commenter  | Type of Comment         | Page       | Comment                                                                                                                                                                                     | Staff Opinion     | Toole Opinion                                             |
|-----------|------------|-------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------|
| 10/1/2018 | Kevin Ward | Editorial               | 45         | Need more color variation on the map of projects in Figure 6.                                                                                                                               | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | Throughout | Change header to read "Hyattsville Transportation Study" not "Hyattsville Transportation Plan"                                                                                              | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 3-4        | Changes to Table of Contents: remove "Travel Behavior Change" line item; Add "Traffic Calming" and "Bike Facility Types" as lines under section 5; Add Strategy 9 line item under Section 6 | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 6          | Add Strategy 9 to list of strategies                                                                                                                                                        | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 7          | Delete blank page                                                                                                                                                                           | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 10         | Change labeling of charts, maps, etc. universally to "Exhibit X" and ensure title text is centered                                                                                          | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 10         | Add route names for Route 1 (US 1) and Route 1 Alternate (US 1 ALT)                                                                                                                         | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 11         | Replace the word "policies" with "strategies" throughout page                                                                                                                               | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 12         | Change bullet point to black                                                                                                                                                                | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 13         | Change title of chart to "Exhibit 2"                                                                                                                                                        | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 15         | Remove "This space is intentionally left blank" text                                                                                                                                        | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 16         | Rewording of paragraphs 2 and 3.                                                                                                                                                            | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 20         | Change title of chart to "Exhibit 3"                                                                                                                                                        | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 22         | Change reference to "Figure 2" to "Exhibit 4"                                                                                                                                               | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 23         | Change title of map to "Exhibit 4"                                                                                                                                                          | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 27         | Change title of figure to "Exhibit 5"                                                                                                                                                       | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 30         | Change title of chart to "Exhibit 6"                                                                                                                                                        | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 31         | Change title of figure to "Exhibit 7"                                                                                                                                                       | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 33         | Reword "via other measures" to read " or other measures to reduce cut through traffic."                                                                                                     | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 35         | Text on bullet points in strategy 3 seem to be smaller than text of the rest of the document                                                                                                | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 41         | Change title of table to "Exhibit 8"                                                                                                                                                        | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 41         | Change reference to "page 48" to be a reference to Exhibit 9"                                                                                                                               | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 45         | Change title of map to "Exhibit 9"                                                                                                                                                          | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 47         | Change title of chart to "Exhibit 10"                                                                                                                                                       | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 49         | Change title of chart to "Exhibit 11"                                                                                                                                                       | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 51         | Change reference to Table 5 to "Exhibit 10"                                                                                                                                                 | Staff concurs.    | Toole will make the change.                               |
| 10/9/2018 | Staff      | Editorial               | 51         | Change reference to Table 4 to "Exhibit 8"                                                                                                                                                  | Staff concurs.    | Toole will make the change.                               |
| 11/6/2018 | Staff      | Editorial               | Appendix A | Within Appendix A: Existing Conditions Memo, there are referenced to appendices 1-A through 1-F. These do not seem to be attached to this document.                                         |                   |                                                           |
|           | Staff      | Project Recommendations | 35         | Circulation changes proposed in Strategy 4 should be listed as individual project recommendations in the table on page 41.                                                                  | Staff concurs.    | Toole will make the change.                               |
| 10/1/2018 | Tom Wright | Data Collection         | N/A        | There seems to be no information collected on the intersection of Wells Boulevard & Adelphi Road.                                                                                           | No Staff comment. | Correct. It was not highlighted as a problem intersection |



| Date       | Commenter        | Type of Comment         | Page | Comment                                                                                                                                                                                                                                                  | Staff Opinion                                                                                                                                  | Toole Opinion                                                                                                                                                                                          |
|------------|------------------|-------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/2/2018  | Dan Behrend      | Project Recommendations | N/A  | Create a bike boulevard on Queensbury Road                                                                                                                                                                                                               | Staff defers to Toole for their expertise.                                                                                                     | Queensbury is designated for traffic calming project to discourage cut-through traffic. It may be designated as BB in the future if the volume can be reduced to below 3000 ADT and speed below 20 mph |
| 10/12/2018 | Kristina Al      | Strategies              | 39   | The amount of parking on some streets make them unsafe for driivng. Consider only allowing parking on one side of the street or with residential permits only. Improving lighting, sidewalks and biking would be outstanding.                            | Staff concurs and will look at parking restrictions as part of the citywide review of our residential parking zones.                           | No action needed by Toole.                                                                                                                                                                             |
| 10/12/2018 | Kristina Al      | General                 | N/A  | Access to the UMD shuttle is onerous for residents. Instead of an annual card that has to be renewed in person, consider mailing a card to all residents or providing a sticker that can be added to a drivers license that enables use of the shuttles. | Not relevant to this document, but staff will pass on the message.                                                                             | No action needed by Toole.                                                                                                                                                                             |
| 10/14/2018 | Dylan Hutchinson | General                 | N/A  | Residents which each project will affect most should have the heaviest weighted opinions on the subject project.                                                                                                                                         | Staff concurs, and project specific outreach will occur as each project is initiated.                                                          | No action needed by Toole.                                                                                                                                                                             |
| 10/14/2018 | Dylan Hutchinson | General                 | N/A  | There are numerous projects which appear to overlap in an opposing manner (e.g. converting a street from one-way to two-way and also making the street a bike boulevard. On narrow streets, where will the cars go? Street parking is already sparse.)   | Staff defers to Toole for their expertise.                                                                                                     | Two-way conversion and bike boulevard are complimentary as it slows down traffic speed and improves bike connectivity. The impact on parking needs to be addressed as each project is initiated.       |
| 10/14/2018 | Dylan Hutchinson | Strategies              | 39   | The extension of paid parking zones should be limited, as it discourages business patronization. Time limit parking should be employed near commercial districts in place of paid parking.                                                               | Staff intends to continue the practice of paid parking in our commerical districts.                                                            | No action needed by Toole.                                                                                                                                                                             |
| 10/14/2018 | Dylan Hutchinson | General                 | N/A  | Consult with emergency services and consider their response vehicle access prior to any road improvement project or change in traffic patterns.                                                                                                          | Hyattsville City Police have reviewed the document and provided their comment on recommended changes that may cause issues for their response. | No action needed by Toole.                                                                                                                                                                             |
| 10/24/2018 | Leah Wolf        | Project Recommendations | 44   | I wholeheartedly support the proposal to install a traffic light at the intersection of Armentrout and alternate Route 1. Present visibility from Armentrout to alternate Route 1 southbound is very poor.                                               | Staff concurs.                                                                                                                                 | No action needed by Toole.                                                                                                                                                                             |

| Date       | Commenter       | Type of Comment         | Page | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Staff Opinion                                                                                                                               | Toole Opinion                                                                                                                                           |
|------------|-----------------|-------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/29/2018 | Chris Currie    | Project Recommendations | N/A  | Although 30 people proposed or upvoted a sidewalk connector between the south end neighborhood and the civic center -- twice as many as the next most popular idea on the Transportation Plan forum, it was once again left out of the report being presented to the City Council. My neighbors and I strongly encourage the City Council to include the 42nd and Decatur sidewalk connector in the Transportation Plan in order to make a necessary improvement in the safety of pedestrians -- especially schoolchildren -- currently competing with motor vehicles on a narrow and low-visibility section of road in south Hyattsville. | Staff concurs and believes these sidewalk connections can be made, even if they are not specifically noted in the study.                    | No action needed by Toole.                                                                                                                              |
| 10/29/2018 | Julia Dezelski  | Project Recommendations | 43   | I would like to voice my support specifically for the following: 1) the Hamilton Street Complete Street Design and Reconstruction - this reconfiguration plan should aim to provide improved driving conditions, safety, walkability, as well as aim to connect the metro station with the historic district.                                                                                                                                                                                                                                                                                                                              | Staff concur.                                                                                                                               | No action needed by Toole.                                                                                                                              |
| 10/29/2018 | Julia Dezelski  | Project Recommendations | N/A  | I would like to voice my support for the swift execution of the 2005 West Hyattsville TDDP - this plan included the Ager Road Complete Street Project and the residential development north of the West Hyattsville metro station. I would also like to underscore that travelers, commuters, and other drivers entering and exiting the District of Columbia on a daily basis travel along the corridor between Hamilton Street and Chillum Road on a regular basis. This passageway is possibly the least welcoming part of the city and unfortunately, is also the gateway into Hyattsville from Northeast DC.                          | Though not specifically listed in the study, staff concur.                                                                                  | No action needed by Toole.                                                                                                                              |
| 10/29/2018 | Julia Dezelski  | Project Recommendations | N/A  | Shuttle system between Arts District and West Hyattsville Metro. Overall, the plan seems to focus more attention to Prince George Metro and the surrounding areas than to the Arts District and the south end side of the city - specifically West Hyattsville metro and the surrounding area. A shuttle between the Arts District/Historic District and the West Hyattsville metro would be very valuable to the citizens of that area. It would also presumably encourage non-residents to visit the Arts District.                                                                                                                      | A circulator study is being completed outside of the scope of this project. Findings of the circulator study will be presented in December. | No action needed by Toole.                                                                                                                              |
| 10/22/2018 | Joanne Waszczak | Project Recommendations | N/A  | Please add intersection improvements at Baltimore Avenue and Jefferson Street. Residents have been advocating for improvements at that intersection. There is a need for a fourth crosswalk with a pedestrian signal. There is also a need for an exclusive pedestrian interval/barnes dance to allow cyclists and pedestrians to cross.                                                                                                                                                                                                                                                                                                   | Staff defers to Toole for their expertise.                                                                                                  | Pedestrian crossing on the north leg is needed at the intersection. It's not clear why it was eliminated by the SHA and require coordination with them. |
|            | Sarah Eisen     | Project Recommendations | N/A  | I was shocked to see that improving pedestrian safety at Rt. 1 and Jefferson Street was omitted from this report. This intersection is unsafe and I fear for my family whenever we cross here. Please please consider adding it to the plan.                                                                                                                                                                                                                                                                                                                                                                                               | This is a popular sentiment and Staff defer to Toole for their expertise on ways/the necessity to improve pedestrian safety in this area.   | The project can be added in the list. It will require coordination with SHA.                                                                            |

| Date       | Commenter       | Type of Comment         | Page | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Staff Opinion                                                                                                                                                                                                                                                                                             | Toole Opinion                                                                           |
|------------|-----------------|-------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 10/24/2018 | Leah Wolf       | Project Recommendations | 35   | The idea to make Farragut Street from 42nd Avenue eastbound to Route 1 has been tried before and found to be unsafe. Visibility to turn north from Farragut to 42nd is very poor and there is parking on both sides of Farragut between 42nd Avenue and 43rd Avenue and not enough space for both eastbound and westbound traffic. This was tried before a number of years ago and after a short period of time the two-way traffic was restored to eastbound only. There might be City staff still around who remember this earlier experiment.                                                                                                                                                                                 | Staff disagrees and belive the road can support two-way traffic.                                                                                                                                                                                                                                          | Toole believes a two-way conversion is the appropriate intervention on Farragut Street. |
| 10/18/2018 | Thomas Wright   | Project Recommendations | 42   | NS-5, connecting Calverton and Dean Drive, needs additional research. This strategy is in complete opposition to the Prince George's Plaza TDDP . The TDDP identified this path as part of Strategy TM7.3 to implement exclusively non-motorized connections between these streets. This should either be striken from the plan or reworded to align with the TDDP goals.                                                                                                                                                                                                                                                                                                                                                        | Staff acknowledges that many residents of University Hills do not want to see a vehicular connection from Calverton to Dean. Staff defer to the City Council to make a determination on weighing the desires of the community versus the necessary improvement in connectivity the connection would make. | No action needed by Toole.                                                              |
| 10/26/2018 | Joyce McDonald  | Project Recommendations | 42   | Our Ward 3 Council person Tom Wright has posted his comments regarding the Plan, and I want to support his assessment that the City s proposed extension of Calverton Drive in a full two lane street/sidewalk connection with Dean Drive is completely at odds with the recommendations of M-NCPPC planners which were adopted by the Planning Board and County Council in the TDDP. Connections through walking paths and bike lanes in this area are in keeping with TDDP intentions to manage storm water runoff, while encouraging those modes of transportation instead of automobile. The City s plan in general is designed to encourage the same; why does it add more concrete and auto traffic in this specific area? | Staff acknowledges that many residents of University Hills do not want to see a vehicular connection from Calverton to Dean. Staff defer to the City Council to make a determination on weighing the desires of the community versus the necessary improvement in connectivity the connection would make. | No action needed by Toole.                                                              |
| 10/29/2018 | Judith Anderson | Project Recommendations | 42   | The proposal to connect Calverton and Dean Drives to allow vehicular traffic should be reconsidered. Hyattsville has established a goal of creating walkable and bikeable neighborhoods, and this proposal is in complete opposition to that goal. It would funnel traffic from a high-density area into a small residential neighborhood with narrow streets that cannot accommodate additional traffic. Calverton Drive is so narrow that when cars are parked on the street, only one-way traffic is possible. Connecting Calverton to Dean Drive will divert traffic from major roadways into a neighborhood with streets that were not designed to handle it.                                                               | Staff acknowledges that many residents of University Hills do not want to see a vehicular connection from Calverton to Dean. Staff defer to the City Council to make a determination on weighing the desires of the community versus the necessary improvement in connectivity the connection would make. | No action needed by Toole.                                                              |

| Date       | Commenter       | Type of Comment         | Page | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Staff Opinion                                                                                                                                                                                                                                                                                             | Toole Opinion                                                                                                                                                       |
|------------|-----------------|-------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/29/2018 | Emily Palus     | Project Recommendations | 42   | Opposed to NS-5, Let Calverton be a dead end. How about a foot/bicycle path between Calverton and Dean, as an alternative to a vehicular connection, and other paths that would help students and others safely navigate within the neighborhood and to commercial areas to the south? Foot and bicycle connectivity was raised in the first public meeting, drawn on the maps, provided in the map wiki, and spoke up in the Speak-up Hyattsville app. Adding asphalt to extend Calverton was opposed in all these data collectors - and has been for more than 25 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Staff acknowledges that many residents of University Hills do not want to see a vehicular connection from Calverton to Dean. Staff defer to the City Council to make a determination on weighing the desires of the community versus the necessary improvement in connectivity the connection would make. | No action needed by Toole.                                                                                                                                          |
| 10/29/2018 | Matthew Palus   | Project Recommendations | 42   | Please don't "induce" traffic on Calverton Drive. Improvement in connectivity between Calverton and Dean Drive via walking or cycling, yes do it. There are already informal footpaths across private property providing this connection. Formalize them, buy the right-of-way to establish a safe, appropriately lighted non-motor vehicle access that is passable to emergency vehicles but does not siphon automobile traffic down Calverton Drive. *This* is a sustainable alternative. If induction of traffic applies to pedestrians and cyclists, please do induce more pedestrian and cycling traffic down Calverton. The intersection of Adelphi and Wells needs help desperately. Try and cross Adelphi on foot within the time permitted by the light. Try and cross with a stroller. Try and make a left turn at that intersection on a bicycle. I understand the study is constrained by what the City of Hyattsville can and cannot do. But a study like this can and should document such a problem and a hazard, so that agents pushing the SHA to address the problem have something concrete, a published source to point to. | Staff acknowledges that many residents of University Hills do not want to see a vehicular connection from Calverton to Dean. Staff defer to the City Council to make a determination on weighing the desires of the community versus the necessary improvement in connectivity the connection would make. | No action needed by Toole.                                                                                                                                          |
| 10/1/2018  | Bart Lawrence   | Project Recommendations | N/A  | Oglethorpe does not seem like a good choice for a bike boulevard; Farragut Street, Madison Street or Queensbury seem like better routes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Staff defers to Toole for their expertise.                                                                                                                                                                                                                                                                | Oglethorpe was selected because of continuous EW conncection from Baltimore Ave to Queen Chapel Rd. Madison St and Farragut St do not connect to these two streets. |
| 10/29/2018 | Jennifer Kaleba | Project Recommendations | 42   | The last time this was up for comment, many directly impacted residents spoke out against the eminent domain action and subsequent new road construction to connect 39th Ave to Nicholson and I will, again, reiterate that opposition. Such construction would create yet another speed-through street in the city. Without additional housing plots on that corridor, it's only function would be as a short-cut. in a city that values walkability and bicycle transit, that's just silly. Creating a walk/bike path through that corridor for quicker access to Prince George's Plaza metro and shops would be more in keeping with the stated goals of the city.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | As indicated in the Final Draft Report, there will be no use of eminent domain to make any of the "new street" connections. Any project recommendations for new streets are included in the document in order provide the framework for new connections should redevelopment occur.                       | No action needed by Toole.                                                                                                                                          |

| Date       | Commenter  | Type of Comment         | Page | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Staff Opinion                                                                                                              | Toole Opinion             |
|------------|------------|-------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------|
| 10/29/2018 | Lissa Bell | Project Recommendations | N/A  | I'm late to the party here, but I'd propose adding Quintana St. to the list of small, narrow streets receiving very heavy cut-through traffic. This tiny street between Queens Chapel and East-West Hwy is a (infamously) popular cut-through for people trying to avoid the Belcrest/Queens Chapel intersection light debacle. AND it's DANGEROUS, not just inconvenient, for those of who live on the street because the street's curve makes visibility very poor. It's a mess. | Staff acknowledge there is cut-through traffic on Quintana Street, but do not think it warrants intervention at this time. | Toole concurs with Staff. |





| ACTION NEEDED                    |  |
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| No change necessary to document. |  |
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| ACTION NEEDED                                                              |  |
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| No change necessary to document.                                           |  |
| No change necessary to document.                                           |  |
| No change necessary to document.                                           |  |
| Add crossing on the north leg of the intersection to the list of projects. |  |

| ACTION NEEDED                                                               |  |
|-----------------------------------------------------------------------------|--|
| Need direction from City Council on whether to include this recommendation. |  |
|                                                                             |  |
|                                                                             |  |
|                                                                             |  |
| Need direction from City Council on whether to include this recommendation. |  |



| ACTION NEEDED                                                               |  |
|-----------------------------------------------------------------------------|--|
| Need direction from City Council on whether to include this recommendation. |  |



# Hyattsville Transportation Study

Draft Final Report

September 20, 2018

Prepared by:

**Toole**DesignGroup

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## Appendices

Appendix A: Technical Memorandum 1: Existing Conditions Report

Appendix B: Technical Memorandum 2: Future Condition Results

Appendix C: Wayfinding Report

Appendix D: Planning-Level Cost Estimate

## I. Executive Summary

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Cities around the country are fundamentally rethinking the way people move – taking a more holistic approach that considers all modes of transportation and community benefits, beyond just moving automobiles. With the motto of “A World Within Walking Distance,” Hyattsville prides itself on being truly multimodal. This study reflects these national trends and local priorities.

This Transportation Study takes a comprehensive look at the City of Hyattsville’s transportation network and recommends several improvements. In addition to detailed technical analysis, such as collecting traffic data and roadway inventory and modeling future traffic intersections, this process builds on prior studies, and includes substantial public input received throughout the project. This Study will help the City plan and build a transportation system that works for everyone, regardless of age, mobility, or transportation mode. It will help the City support anticipated growth and investment, improve and maintain existing transportation infrastructure, carry out new projects, and determine priorities for the next twenty years.

This Study seeks to carry out the vision of the Speak Up! HVL Community Sustainability Plan, Hyattsville’s framework for the city’s future growth and evolution. It has six goals, which align with those goals set out in the Sustainability Plan:

- Improve safety along major roads
- Enhance and increase safe connectivity for pedestrians
- Improve traffic flow within neighborhoods
- Strengthen connectivity for cyclists
- Support development around the Metro stations and Gateway Arts District
- Support environmentally friendly, sustainable growth

These six goals form the basis for a set of eight strategies that will guide the City as it further invests in its transportation system. These strategies will help the City determine what projects to fund and construct, which transportation modes to prioritize in each location or setting, and articulate its transportation needs to the County and State, which are responsible for some of the larger roads within City limits. Those eight strategies are:

- Strategy 1: Complete the City's street grid with new street connections.
- Strategy 2: Design streets for lower speeds.
- Strategy 3: Prioritize people on foot in street design.
- Strategy 4: Where appropriate, change traffic circulation.
- Strategy 5: Prioritize the comfort of people on bikes in street design.
- Strategy 6: Design intersections to improve safety for all users.
- Strategy 7: Prioritize connections to and from the Metro stations and Arts District
- Strategy 8: Integrate trails into the local transportation network.

These strategies informed the development of 61 transportation projects the City can execute in the coming years. Each of these projects has been ranked based on their ability to achieve the Sustainability Plan's goals, producing a list of 20 top priority projects for the City. More information on the strategies, as well as the list of recommended projects, can be found in Chapter 6, which discusses the City's proposed transportation network.

This Study is intended to guide capital and operating investment in the City of Hyattsville's transportation system. Through extensive data collection and analysis, and with significant input from the people who make this community great, the City has developed a vision for making the City an easier and safer place to get around. It builds on the City's rich history as a local and regional transportation hub, while preparing it for a more socially, economically, and environmentally sustainable future. This Study provides a framework for future investments in the City that will help everyone who lives, works, or visits Hyattsville.

In the very near future, Hyattsville will be a place where anyone, regardless of age, background, or ability, can travel safely, comfortably, and affordably. Its transportation network will prioritize people-friendly streets that add energy and vitality to their surroundings while accommodating the inevitable flow of traffic into and out of the City. The transportation system will support its sustainability goals, prioritizing active transportation for shorter trips and access to rapid transit for longer trips. Hyattsville's streets will serve as the backdrop for community events and festivals, as well as the rhythms of everyday life: traveling to school or work, running errands at a local business, enjoying a leisurely stroll or bike ride, spending time with friends, family, and loved ones.

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## 2. Introduction

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Since the late 1990's, the City of Hyattsville and surrounding parts of Prince George's County have grown substantially, which has brought significant transportation challenges. The City has conducted several studies over the past several years to address these challenges, including vehicular traffic counts, bicycle and pedestrian accessibility, as well as policy analysis. To build on these efforts and create a holistic vision for its transportation network, in 2017 the City secured the services of Toole Design Group (TDG) to prepare a city-wide multimodal Transportation Study.

This Transportation Study provides a comprehensive assessment of the transportation network of the City of Hyattsville and recommends several improvements that are anticipated to address both the existing and future transportation challenges. This document provides a summary of different modal assessment while the accompanying technical appendices provides the detailed analysis, as well as public input received during the course of the project. The recommendations of this Study will help the City build a transportation system that works for everyone, regardless of age, mobility, or transportation mode. It will help the City support anticipated growth and investment, improve and maintain existing transportation infrastructure, carry out new projects, and determine priorities for the next twenty years.

To do so, the City has six goals for this Transportation Study:

- Identify **bicycle** and **pedestrian** needs of the City
- Evaluate existing and future **roadway needs**
- Evaluate **one-way streets** and circulation
- Evaluate **parking issues** on specific areas
- Prepare a **wayfinding plan**
- Evaluate **school traffic** and infrastructure

### Why This Study is Needed

There are three overarching trends shaping transportation issues in Hyattsville today: growth in population, changes in transportation behaviors, and travel to or through the City. This Study aims to address all three.

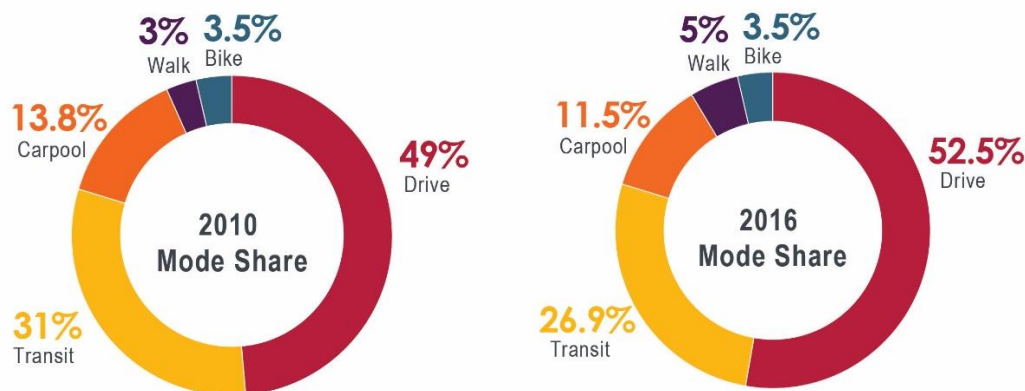
#### Population Growth

Hyattsville has experienced considerable growth over the past twenty-six years, with its population increasing from 13,864 in 1990 to 18,262 in 2016, according to the Census. Much of that growth has occurred around in two areas: around the Prince George's Plaza Metro station, which has become a hub for shopping, offices, and multi-family housing; and the Gateway Arts District along Baltimore Avenue (Route 1), the City's historic heart and now home to hundreds of new homes, shops, and arts institutions. In addition, the Riverfront at West Hyattsville Metro development at the West Hyattsville Metro station is anticipated to include 183 townhomes

and 400 apartments. Meanwhile, most employed residents continue to commute to jobs outside the City. From 2002 to 2015, the percentage of residents who both live and work in the City decreased from 4.7% to 2.5%, according to the American Community Survey.

### Travel Behavior Change

As of 2015, the largest destinations for residents commuting out of Hyattsville for work are Washington, DC (38.7%); three communities in Maryland, College Park (4.4%), Bethesda (2.8%), and Silver Spring (2.4%); and Arlington, VA (2.0%). The number of workers per household is growing, increasing from an average of 1.78 workers per household in 2009 to 1.98 workers in 2016. Subsequently, the number of people traveling to and from work is increasing faster than the growth in population. The average number of cars per household is lower in Hyattsville than the national average, and car ownership rates appear to be declining: in 2016, 60% of Hyattsville households have had access to one or no vehicles, compared to 55% in 2010. Hyattsville residents' active transportation habits have changed during the same period. More City residents are walking to work; 5% walked in 2016, compared to 3% in 2010. Bicycling habits remained consistent at 3.5%. At the same time, more residents are driving to work (52.5% compared to 49%), fewer are taking transit (31% to 26.9%), and fewer are carpooling (13.8% to 11.5%).



*Mode Shift Between 2010 and 2016*

This shifting travel behavior may be the result of trends happening outside of the City's control, such as the reliability of the Metrorail system, or the rise of ride-hailing services such as Lyft and Uber that allow residents to use transit less. However, the increase in walking and decrease in car ownership indicate that more residents are taking advantage of the City's compact, walkable neighborhoods, and the trend indicates that there are opportunities to encourage more walking and bicycling. Based on the input received during the public meetings held for the project, residents frequently comment that because of their condition, the streets are not always comfortable or safe for them to use when they get around on foot or bike today.

## Traffic Volume Changes

Several State of Maryland roads run through Hyattsville, carrying traffic originating and ending in other jurisdictions. The volume of traffic on those roads has changed in recent years, according to Average Annual Daily Traffic (AADT) counts from the Maryland State Highway Administration. As shown in Table I, between 2010 and 2017, motor traffic volumes decreased on Queens Chapel Road (MD 500) and Hamilton Street/38<sup>th</sup> Street (MD 208), while it increased on East-West Highway (MD 410), Route 1, and Route 1 Alternate (both of which are signed as Baltimore Avenue). This may be due in part to growth in the Prince George's Plaza and Gateway Arts District, both of which are regional destinations for shopping, dining, and entertainment. It may also be the result of growth in surrounding areas, which has generated increased through traffic within the City itself.

**Table I : Average Annual Daily Traffic (AADT) Changes on Major Streets in Hyattsville**

| Road                          | Location                   | 2010 ADT | 2017 ADT | % Change |
|-------------------------------|----------------------------|----------|----------|----------|
| East-West Highway             | East of Belcrest Road      | 26,660   | 31,101   | 16.66%   |
|                               | East of Adelphi Road       | 48,370   | 49,271   | 1.86%    |
| Queens Chapel Road            | South of East-West Highway | 24,312   | 22,582   | -7.12%   |
|                               | South of Ager Road         | 41,882   | 35,850   | -14.40%  |
| Hamilton Street               | East of Queens Chapel Road | 17,372   | 15,880   | -8.59%   |
| 38th Street                   | South of Hamilton Street   | 7,042    | 6,943    | -1.41%   |
| Baltimore Avenue<br>(Route 1) | South of Jefferson Street  | 25,830   | 31,851   | 23.31%   |
|                               | North of Decatur Street    | 13,230   | 16,871   | 27.52%   |

While this Study cannot directly address regional traffic behavior, it can provide recommendations that City of Hyattsville would like to see implemented by Maryland State Highway Administration (SHA) that address the impact of regional traffic on residents. Moreover, this Study recommends transportation options for residents, workers, and visitors, and improve traffic circulation through the City so that through traffic does not restrict local residents' ability to travel within their community and enjoy their public streets.

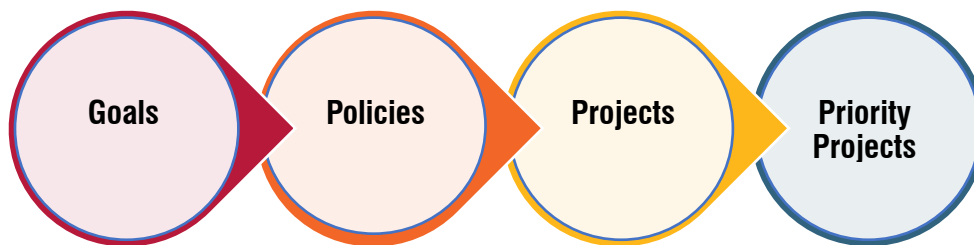
## Study Approach

In 2017, the City released its Speak Up! HVL Community Sustainability Plan, which used an extensive outreach process to produce a vision for creating a stronger economy, a greater sense of community, and a healthier environment. This Study seeks to carry out the vision of the Community Sustainability Plan, Hyattsville's framework for the city's future growth and evolution. The Study has six goals, which align with those goals set out in the Sustainability Plan:



- Improve safety along major roads
- Enhance and increase safe connectivity for pedestrians
- Improve traffic flow within neighborhoods
- Strengthen connectivity for cyclists
- Support development around the Metro stations and Gateway Arts District
- Support environmentally friendly, sustainable growth

These six goals form the basis for a set of policies that will guide the City as it further develops its transportation system. These policies will help the City determine what projects to fund and construct, which transportation modes to prioritize in each location or setting, and articulate its transportation needs to the County and State, which are responsible for some roads within City limits. In the context of this Study, these policies were used to create a list of 61 transportation projects that the City can execute in the coming years. A 23-point scale, using metrics derived from the six Community Sustainability Plan goals, was created to rank each of these projects, producing a list of 20 top priority projects for the City. The chart below illustrates this process by which the Study Team developed the Study.



More specifically, this Study undertook the following detailed data collection and analyses to determine the transportation needs of the City:

- Collected current traffic data, roadway inventory and conducted analysis to quantify the multimodal assessment at key intersections and roadways (See Existing Condition Memo in Appendix A);
- Analyzed future traffic conditions at study intersections by incorporating future traffic growth and trips generated by approved developments;
- Solicited input from the public through various mechanisms, including seven public meetings, pop-up tables at public events, and on-line WikiMap survey;
- Reviewed previous planning documents that relate to transportation in the City, including the Prince George's Plaza Transit District Development Plan, the West Hyattsville Transit District Development Plan, the Gateway Arts District Sector Plan, the Hyattsville Pedestrian and Bicycle Master Plan, and the Speak Up! HVL Community Sustainability Plan;
- Compiled transportation improvement recommendations that meet the current and future transportation needs of Hyattsville;

- Based on the analysis performed in this Study, prepared a Sequential Action Plan to assist City staff in implementing the recommended projects and policies.

### 3. The State of Transportation in Hyattsville

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#### City History

Since its founding, transportation has shaped Hyattsville's development patterns. During the 19<sup>th</sup> century, the Washington and Baltimore Turnpike and the Baltimore and Ohio Railroad's Washington Line connected the city to Washington and Baltimore, as well as communities in between. Shortly after Hyattsville's incorporation in 1886, it was already one of the largest communities in Prince George's County. In 1893, the electric streetcar connected the city to Washington, DC, establishing it as a commuter suburb. Hyattsville also became a regionally significant destination when its main street, Baltimore Avenue, was named part of Route 1, a national highway corridor between Maine and Florida.

During the 20<sup>th</sup> century, Hyattsville began to take its current form. A system of regional stream valley parks was established along the Anacostia River during the 1930s, resulting in the creation of the Northwest Branch and Northeast Branch trails in the City. Regional bus service came to the area in the 1950s, followed by the opening of Metro's Green Line in 1991, which brought two stations, West Hyattsville and Prince George's Plaza. Today, Hyattsville is a vital part of the Washington, DC metropolitan area, due in large part to its extensive and well-traveled transportation system.

#### Hyattsville Today

Located in northern Prince George's County, Hyattsville today is an increasingly popular destination for people seeking easy access to Washington, DC and regional job centers. It is a very diverse community, with residents hailing from many cultures and backgrounds. There is no majority racial or ethnic group in the City.

Hyattsville has three primary activity centers that draw visitors and shoppers from within the City and the surrounding area. **Hyattsville Crossing** (formerly **Prince George's Plaza**), located at the Prince George's Plaza Metro station, is home to a regional, car-oriented shopping mall with many big-box retailers, as well as several office buildings, the Hyattsville branch of the Prince George's County library system, the Hyattsville campus of Prince George's Community College, and a growing residential population. **West Hyattsville**, also the site of a Metro station and a significant residential development under construction, has a smaller, neighborhood-focused shopping district along Queens Chapel Road and is adjacent to Northwest Branch Park. The **Gateway Arts District** extends along Baltimore Avenue (Route 1) from Mount Rainier and the Washington, D.C. border to the historic heart of Hyattsville. Within the City, the Gateway Arts District is home to several arts institutions and locally-owned shops and restaurants, along with Hyattsville City Hall, Prince George's County's District Court, and Prince George's County Police District 1.

According to the United States Census, the City is the 14<sup>th</sup>-largest municipality in the State of Maryland, and the 5<sup>th</sup> largest municipality in Prince George's County in terms of population. However, in terms of population and employment density, Hyattsville is the 2<sup>nd</sup> most dense community in the County, which indicates that public investment in high-quality multimodal transportation network in the City will likely be used extensively by residents and employees.

**Table 2 : Comparison with Communities in Prince George's County**

|                    | Population    | Employment   | Land Area (sq. mi.) | Population Density | Employment Density | Metro Stations |
|--------------------|---------------|--------------|---------------------|--------------------|--------------------|----------------|
| Bowie              | 57,633        | 14,742       | 18.43               | 3127               | 800                | 0              |
| College Park       | 31,942        | 28,362       | 5.64                | 5663               | 5029               | 1              |
| Laurel             | 25,703        | 12,624       | 4.3                 | 5977               | 2936               | 0              |
| Greenbelt          | 23,623        | 3,238        | 6.28                | 3762               | 516                | 1              |
| <b>Hyattsville</b> | <b>18,262</b> | <b>8,482</b> | <b>2.67</b>         | <b>6840</b>        | <b>3177</b>        | <b>2</b>       |
| New Carrollton     | 12,727        | 661          | 1.53                | 8318               | 432                | 0              |

## What About All the Previous Studies?

This Study builds on several previous studies that have guided the growth and development of the City of Hyattsville and incorporates many of their goals and recommendations. The following is a summary of selected plans. Technical Memorandum I: Existing Conditions Report in Appendix A provides more detail information about all the past studies reviewed as part of this project.

### 2005 West Hyattsville Transit District Development Plan (TDDP)

The West Hyattsville TDDP, was the County's first "form-based" zoning plan, drafted by the Maryland-National Capital Park and Planning Commission, outlines a vision for a transit-oriented community around the West Hyattsville Metro station. Located in southwest Hyattsville, this is identified as an area of the City that will absorb much of its population growth in the coming years. To accommodate that growth, the TDDP recommends a mix of townhomes, apartments, and small-scale retail, a series of new or expanded parks, and a new street grid providing new pedestrian, bicycle, and motor vehicle connections between Ager Road and Queens Chapel Road. Many of the recommendations from the West Hyattsville TDDP are currently being implemented, including the Ager Road Complete Street project as well as a significant residential development north of the West Hyattsville Metro station.

### 2008 Pedestrian and Bicycle Study

Drafted by the citizen-led Hyattsville Bike and Pedestrian Safety Committee, the Bicycle and Pedestrian Master Plan contains recommendations for making the walking and bicycling experience in the City safer and more convenient. It recommends the implementation of City-wide sidewalk standards, including closing gaps in existing sidewalks, requiring that sidewalks are of a minimum width, and enforcing basic ADA requirements for all sidewalks. It designates several corridors throughout the City where pedestrian and bicycle access should be a priority,

and identifies specific improvements, including high-visibility crosswalks, street lighting, new or renovated curb ramps, and construction of wider sidewalks. Several of these corridors have been incorporated into this Study's recommendations, including:

- Belcrest Road
- Jamestown Road
- Nicholson Street between Ager Road and Queens Chapel Road
- Hamilton Street between Ager Road and 38<sup>th</sup> Street
- Jefferson Street between 40<sup>th</sup> Avenue and Baltimore Avenue
- 38<sup>th</sup> Street between Hamilton Street and Northwest Branch Trail
- 40<sup>th</sup> Avenue and 41<sup>st</sup> Avenue between Jefferson Street and Queens Chapel Road

#### 2010 Citywide Traffic Study and Transportation Plan

Drafted in 2010 for the City of Hyattsville, the Citywide Traffic Study and Transportation Plan examined traffic conditions in the City, analyzing several dozen intersections. It forecast future traffic volumes and identified potential modifications to improve motor vehicle traffic flow. Additionally, it identifies opportunities to create new active transportation facilities in the City and improve the walking and biking experience. This Study incorporates, with modifications where appropriate, several of the 2010 plan recommendations, including:

- Construction of new sidewalks and high-visibility crosswalk;
- Installation of a High Intensity Activated Crosswalk (HAWK) signal at the Northwest Branch trail crossing of Queens Chapel Road;
- Addition of bike lanes along Adelphi Road;
- Installation of new traffic signals on Ager Road and on Queens Chapel Road;
- Conversion of select one-way residential streets to two-way streets.

#### 2016 Prince George's Plaza Transit District Development Plan (TDDP)

Created by the Maryland-National Capital Park and Planning Commission, the Prince George's Plaza TDDP envisions the creation of a new town center around the Prince George's Plaza Metro station and the Mall at Prince George's. Like the West Hyattsville TDDP, the Plan recommends the creation of new local streets and the extension of existing streets such as America Boulevard to form a street grid. It suggests the implementation of bike lanes on streets including Belcrest Road and Toledo Terrace. It also discusses the long-term redevelopment of the mall as an urban, mixed-use district. This Plan includes many of its recommendations, such as the reconstruction of Toledo Drive, though it proposes multi-use path instead of on-street bike lanes along East-West Highway.

This study also incorporates recommendations and insights from the following plans:

- 2014 West Hyattsville Pedestrian Safety Study
- 2015 City of Hyattsville Customer Preference Survey
- 2004 Gateway Arts District Sector Plan
- ATHA Bikeshare Study

- Hyattsville Elementary School Safe Routes to School activities

Late in 2017, Prince George's County adopted new design standards for urbanized parts of the County, applicable primarily to County roads within the I-495 Beltway. The Prince George's County Urban Street Design Standards are a useful resource when considering Complete Streets retrofits in Hyattsville.

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## 4. Major Transportation Findings

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As part of this Study, extensive data collection and analysis was conducted on various roadways and intersections. Vehicular turning movement, pedestrian, and bicycle counts were collected at 39 intersections throughout the City, during the AM and PM peak hours. An inventory of pedestrian and bicycle infrastructure was collected within a quarter mile of five public schools across the City. Roadway inventory, including quality of sidewalks, was also taken on 16 miles of mostly city-owned and maintained roadways. Appendix A provides the detailed finding of the assessment in Technical Memorandum I: Existing Conditions Report.

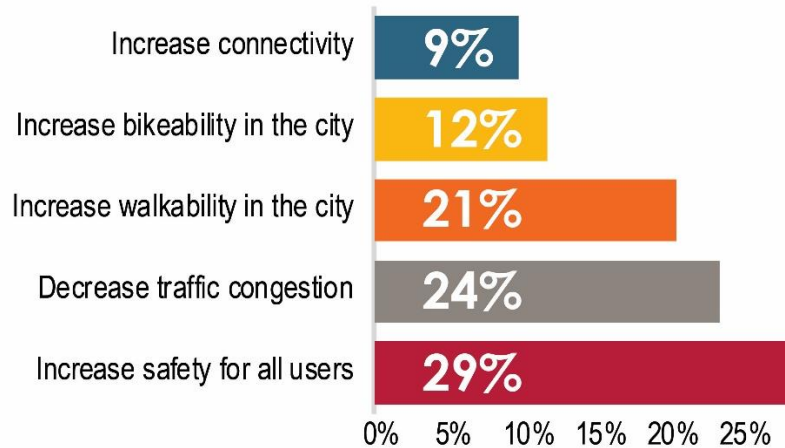
A major effort of this Study was to solicit input from the public to ensure that their concerns are addressed. Two public meetings were held during the project. The 1<sup>st</sup> public meeting was held at the beginning of the project and allowed residents to set the direction of the Study. The major input of the 1<sup>st</sup> public meeting was to focus on the safety of pedestrians and bicyclists as they travel within the City, traffic congestion at major roadways, and cut-through traffic on certain local streets.



*Participants at the first public meeting*

The 2<sup>nd</sup> public meeting was held to present the draft findings and recommendations of the Study. This meeting allowed residents to provide comments on the draft recommendations so that the City can address them before it is finalized. Additional public meetings were held in each Ward, to focus on Ward-specific issues. In addition to the public meetings, City staff held public outreach efforts with various organizations and at public events including the Summer Jam series, farmer's market, etc.

One of the most effective public engagement tools was the online interactive map (WikiMap), hosted on the Speak Up! HVL website, which received over 600 responses. Through the Wikimap and its corresponding survey, respondents were asked about their top priorities for the Study; 29% said it was to increase safety for all users regardless of travel mode; 24% said it was to decrease traffic congestion; 21% said it was to increase walkability in the City; 12% said it was to increase bikeability in the City; and 9% said it was to increase connectivity. These inputs provided valuable information to the City to help determine the specific needs of the community. The following section describes the key findings of the Study.



*WikiMap Respondents' Priorities for this Study*

### Challenges for People Walking

While the City of Hyattsville has a comprehensive network of sidewalks, there are significant gaps in pedestrian accessibility. 10% of the streets that were inventoried lack sidewalks, including large sections of Queens Chapel Road, Ager Road, 38<sup>th</sup> Avenue, 41<sup>st</sup> Avenue, and 42<sup>nd</sup> Avenue. Many other streets have narrow sidewalks less than four feet wide, the minimum requirement under Americans with Disabilities Act (ADA) standards.

There is a wide variety in the presence and quality of other pedestrian facilities, such as curb ramps, crosswalks, pedestrian signals, accessible bus stops, wayfinding, and regulatory signs. 38% of the intersections studied (15 of 39) did not have any crosswalks, mostly on local streets such as 41<sup>st</sup> Avenue, 42<sup>nd</sup> Avenue, and Lancer Drive. Several bus stops along major corridors did not provide accessible landing pads or connection to existing sidewalks, making it difficult for residents or visitors with disabilities to use the existing bus service. Similarly, uneven sidewalks and sloping driveways present barriers for people with disabilities or parents using strollers.

Most streets without sidewalks tend to be in residential neighborhoods, which often make up the very beginning or the very end of a pedestrian's trip.

### Challenges for People Biking

The City's bicycle network contains over 31 miles of bicycle infrastructure, mostly consisting of on-street facilities such as shared-lane markings, known as sharrows, and off-street trails such as the Northeast Branch and Northwest Branch trails. Most bicycle facilities are in good condition. The City's narrow streets and 25-mph posted speed limit make it relatively easy for residents and visitors to travel by bicycle. A network of sharrows and wayfinding currently exists on Gallatin Street, Hamilton Street, Nicholson Street, and 40<sup>th</sup> Avenue. However, existing one-way street configurations on streets such as Longfellow, Oglethorpe, Hamilton, Gallatin, and Farragut can make trips cumbersome and circuitous, especially throughout downtown Hyattsville.



Respondents noted a variety of issues that make it difficult to walk or bike, including a lack of marked crosswalks, heavy and fast traffic, wide streets that encourage motorists to speed, long waits to cross the street at intersections, and a lack of sidewalks.

Respondents identified several streets that were difficult for walking or biking, or were barriers to walking and biking, including:

- East-West Highway
- Queens Chapel Road
- Rhode Island Avenue (Anacostia River to Farragut Street)
- 42<sup>nd</sup> Avenue (Oglethorpe Street to East-West Highway)
- Hamilton Street (Queens Chapel Road to 38<sup>th</sup> Street)
- 38<sup>th</sup> Street (Northwest Branch Trail to Hamilton Street)

### Challenges for People Driving

While motor vehicle congestion does occur within the City, the major roads and intersections in Hyattsville do allow relatively high traffic throughput, with some delays at peak travel times. The City has several state and county roadways, such as Baltimore Avenue (Route 1), Queens Chapel Road, Adelphi Road, and East-West Highway, that serve as regional commuting routes. Drivers using these roads may experience significant delay at certain intersections due to rush hour congestion. The existing operational analysis of 33 study intersections showed that during either AM or PM peak hours, following nine intersections are currently operating with significant delay (>80 seconds) during periods of peak congestion:

- Baltimore Avenue (Route 1) / East-West Highway (MD 410)
- Baltimore Avenue (Route 1) / Hamilton Street (south) / Alternate US 1
- Baltimore Avenue (Alt Route 1) / Charles Armentrout Street
- Toledo Terrace / East-West Highway (MD 410)
- Editors Park Drive / East-West Highway (MD 410)
- Belcrest Road / East-West Highway (MD 410)
- East-West Highway (MD 410) / Queens Chapel Road (MD 500) / Adelphi Road
- Ager Road / Nicholson Street
- Adelphi Road / Campus Drive



It should be noted that all the intersections identified above are either on county or state roadways. While these roadways and intersections are used extensively by regional traffic, they also provide vital access to residents of Hyattsville and impact their ability to travel around the City to conduct daily activities. The improvements recommended by Hyattsville at these intersections, as well as proposed new connections, are

important to residents of the City and should be considered as part of any future improvements on these roadways.

Because of the delays at the major roadways, residents of Hyattsville are concerned about cut-through traffic on local streets. The local streets that were identified as experiencing significant cut-through traffic were:

- Queensbury Road
- Jefferson Street
- Nicholson Street
- 42<sup>nd</sup> Avenue
- Hamilton Street

This Study evaluated the operation of these streets and have recommended solutions that are anticipated to reduce cut-through traffic, while also encouraging more bicycle and pedestrian use.

### **Big Data Analysis**

This Study used state-of-the-art big data collection method of using anonymized cell-phone location services to determine the travel pattern within and outside the City. The following section summarizes the analysis process and findings; and more details are included in Appendix A.

Hyattsville was divided into 16 zones based on different land-uses as well as two outside zones, one containing Maryland outside of Hyattsville, and another containing Washington, DC and Northern Virginia. The data revealed that only about 15% of trips start and end within Hyattsville, while approximately 52% of the trips start or end in other areas of Maryland. The rest of the trips either start or end in DC + Northern Virginia.

The travel patterns between the 16 internal zones within Hyattsville also revealed several important trends. It showed that the zone representing Prince George's Plaza (south of MD 410, west of MD 500 and north of Nicholson Street) (Zone 4 the map on the following page) is a strong destination for adjacent zones, especially from areas south of Nicholson Street (Zones 2 and 3 on the map). However, due to lack of direct roadway connections between these zones, the vast majority of residents would have to drive on Queens Chapel Road and East-West Highway to travel between these zones.

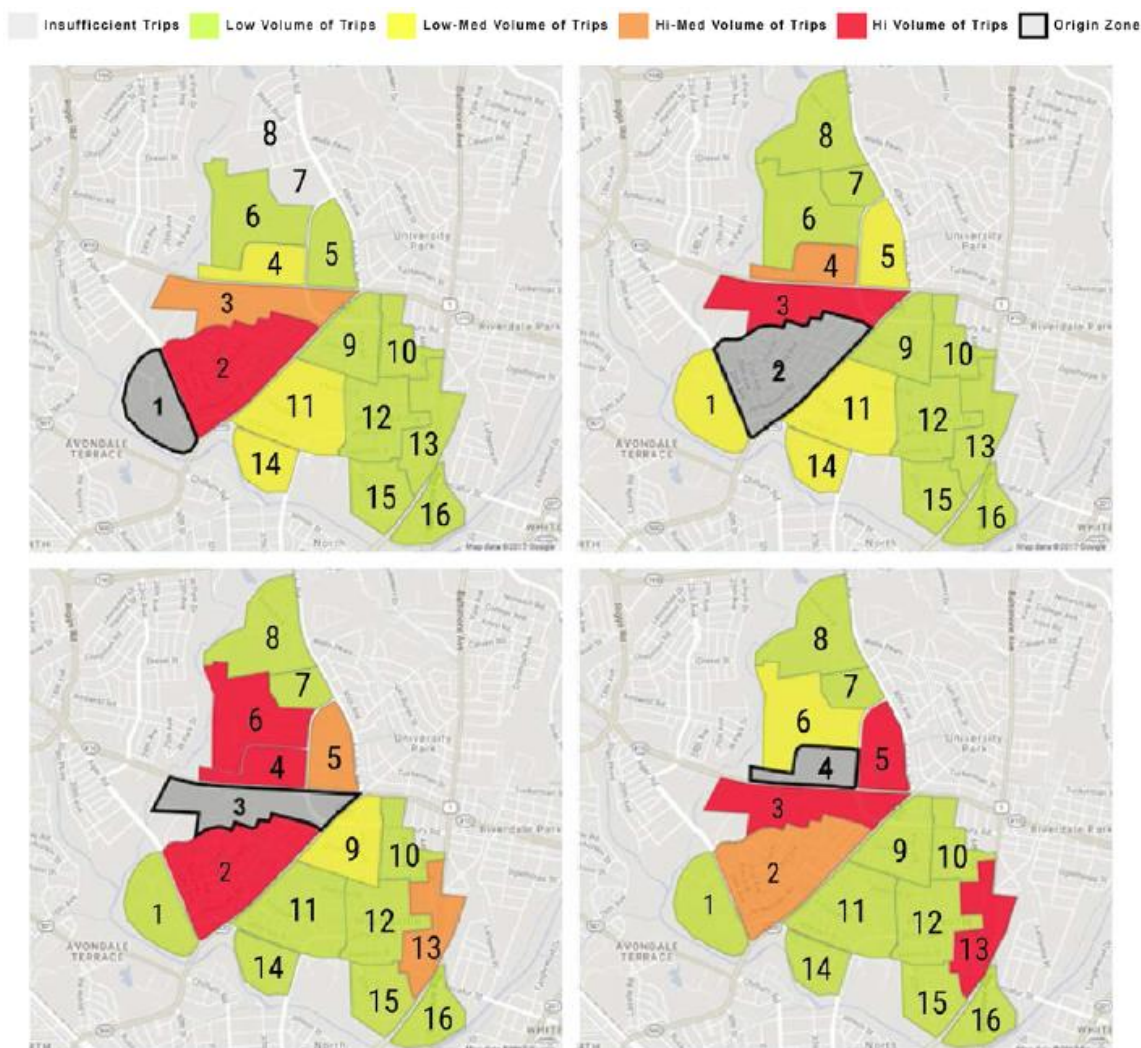
This travel pattern indicates a demand for a more direct connection between these two zones, which could have the additional benefit of reducing local traffic on Queens Chapel and East-West Highway. While a direct roadway connection may not be desirable, a high-quality bicycle and pedestrian connection will likely provide an efficient and direct connection that could accommodate a number of neighborhood trips while reducing traffic from surrounding major roadways, providing much needed relief to residents in adjacent neighborhoods.

Similarly, the big data analysis showed a high number of trips between the Mall at Prince George's and University Town Center on the north side of East-West Highway (MD 410)

(Zone 4 in the map below) and the Arts District on Baltimore Avenue (Route 1) (Zone 13 in the map below). This indicates the demand for the trips between these areas is high and is currently being undertaken by driving personal vehicles. As these areas are less than 1.5 miles apart, providing high-quality alternate modes of transportation can reduce vehicular trips between these areas.

The following maps are an example of the big data analysis of local travel habits. In each map, the area in grey is where trips are originating from, and the darkest-colored zones are where most of those trips end up. These maps illustrate that many trips in Hyattsville are between adjacent zones; for example, most trips originating in Zone 1 (containing the West Hyattsville Metro station) end in Zone 2 (containing nearby residential neighborhoods and the Queens Chapel Town Center shopping area).

**Figure 1 : Example of Big Data Analysis Output showing Trips Originating in Grey Zone and Ending in Other Colored Zones**



## Parking Assessment

Vehicular parking has historically been a challenge in few areas of Hyattsville, for example, near Gateway Arts District and residential areas south of the Prince George's Plaza Metro station. City of Hyattsville identified over 7 miles of roadway segments to assess parking during both early morning and late evening hours. The morning parking counts were taken before 6:30 am and the evening counts were taken between 6:30 pm – 8:30 pm. The morning hour was chosen as that is when maximum residential parking occupancy occurs. Similarly, the evening hour was chosen such that the parking demand is high due to competing parking demand between residential parking and evening retail parking.

The data collected during both hours showed that only about 0.5 miles of block segments experienced parking utilization of over 80%. This indicates that adequate on-street parking is available on most of the street segments assessed.

The block segments with over 80% parking utilization are listed below. Appendix A includes maps with parking utilization on all the streets where parking data was collected.

### *Morning Hour High Parking Utilization Streets*

- Gallatin Street, from 36<sup>th</sup> Avenue to 36<sup>th</sup> Place
- Jamestown Road, from Manorwood Drive to Lancer Drive
- Oglethorpe Street, from 41<sup>st</sup> Avenue to 42<sup>nd</sup> Avenue
- 42<sup>nd</sup> Place from Rhode Island Avenue to the alley

### *Evening Hour High Parking Utilization Streets*

- Jamestown Road from Manorwood Drive to Lancer Drive
- Oglethorpe Street from 38<sup>th</sup> Place to 39<sup>th</sup> Avenue
- Oglethorpe Street from 41<sup>st</sup> Avenue to 42<sup>nd</sup> Avenue
- 42<sup>nd</sup> Place from Rhode Island Avenue to the alley

## Findings

Three of these street segments, Gallatin Street from 36th Avenue to 36th Place; Jamestown Road from Manorwood Drive to Lancer Drive; and Oglethorpe Street from 38th Place to 39th Avenue, are characterized by detached or semi-detached homes with frequent curb cuts. In some cases there is limited off-street parking, or the off-street parking may not be convenient for some housing types (e.g. a single driveway for a duplex structure).

Oglethorpe Street from 41st Avenue to 42nd Avenue is close to two apartment complexes and Hyattsville Middle School, suggesting that the high rate of parking usage may be driven by residents of those two complexes or school faculty and staff. Another contributing factor is that on-street parking is restricted east of 42<sup>nd</sup> Avenue (adjacent to the middle school) and on 42<sup>nd</sup> Avenue south of Oglethorpe which pushes parking demand further west.

42nd Place is adjacent to an evolving commercial district on Rhode Island Avenue, and may be experiencing spillover from the businesses, churches and multifamily buildings along the street.

While many of these have their own parking lots, the availability of free on-street parking likely contributes to the higher occupancy rate. Furthermore, the nature of these businesses is changing with retail establishments where customers stay for one or more hours at a time replacing other types of businesses that may have had relatively few visiting customers.

## **Recommendations**

**Tiered residential permit parking fees.** In some cases – one household may be responsible for many of the cars parked on a street. Some cities have tiered residential parking permit programs wherein the first one or two parking permits are free, or very low cost. However, additional permits increase in cost (e.g. \$10 for first permit, \$20 for second permit, \$30 for third permit).

**Expand residential parking permit zones.** Streets near schools and multifamily buildings often experience overflow parking from these uses. The City should evaluate the extents of current parking districts and expand them where parking congestion is an issue.

**Evaluate Hyattsville Middle School parking impacts.** The City should work with PGCPs and Hyattsville Middle School leadership to determine if overflow parking from the school is exacerbating parking congestion on nearby streets. If this is a problem, work with the PGCPs and the school to address the issue through Transportation Demand Management programs that encourage use of transit, carpooling, walking or biking, and other strategies to reduce people driving alone to the school. Longer term, it may be appropriate to expand the school's parking lot.

**Install metered parking (42nd Place only).** As the number of businesses on southern Rhode Island Avenue increases, there will be increased demand for parking. In the short term, consider extending the two-hour parking distance further north on 42<sup>nd</sup> Place, and extending the hours beyond 6pm if evening parking congestions remains an issue. This could be coupled with free parking for permitted residents. As new businesses open and parking demand increases, consider metered parking with automated pay stations as has been implemented in some of the City's public lots.

**Improve wayfinding and connections to city parking lots.** Better wayfinding that directs visitors to the City's existing parking lots can reduce impacts on neighborhood streets. Additionally, better wayfinding and improved pathways between city parking lots and commercial destinations will encourage more people to 'park and walk.' Improvements include pedestrian-scale lighting, managing vegetation, signage directing people to destinations, art along the pathways, etc.

**Parking Lot Districts in commercial areas.** The growth and success of Hyattsville's commercial districts while undoubtedly lead to increased demand for vehicle parking, which can in turn create issues on nearby residential streets. The City should consider establishing one or more Parking Lot Districts (PLDs) wherein resources are pooled to create centralized parking solutions, including surface or structured parking lots, valet services and even parking shuttles. PLDs can be funded in a variety of ways- including parking revenues, business contributions, and



fee payments in lieu of providing required onsite parking. PLDs can help small lot and infill developments meet parking requirements without sacrificing limited onsite space.

**General Considerations.** Any changes to the City’s parking regulations and programs should be accompanied with extensive outreach and education. Parking can be a very sensitive issue for residents and businesses, and it is important that any changes are implemented methodically and with ample communication. Furthermore anything that involves regulatory changes should be implemented with a warning period for the first weeks before any tickets or fines are issued.

Administrative costs and increased workload should also be considered. Expanding the City’s parking permit program will require additional staff time to process applications. Increasing the amount of regulated parking (i.e. permitted, metered) will increase the enforcement workload as well.

## Wayfinding and Signage

Wayfinding signs are important for providing direction to motorists and non-driving travelers. Effective signage can reduce congestion by directing drivers to parking and other destinations, as people are guided to the most direct routes. In addition, good signage is an important aspect of enhancing the “sense of place” to residents and visitors alike. Good signage accentuates the character of the City and conveys the sense of community. This Study evaluated the

design and condition of existing wayfinding signs for both motorized and non-motorized mode of transportation. It also recommends new wayfinding sign design that builds on the streetcar history of Hyattsville and provides a consistent design for different types of signs.

Existing wayfinding signs are generally in good condition and are concentrated along existing bicycle and pedestrian routes. However, there is a variety of wayfinding sign designs in the City, including bike route signs, Anacostia Trails Heritage Area signs, and vehicle-oriented signs. Many of these signs do not comply with Manual on Uniform Traffic Control Devices (MUTCD) size, color, or font standards, nor do they have a consistent design showcasing the City’s unique character and branding. This Study worked with City staff to select a branded wayfinding sign design that respects Hyattsville history and provides a consistent design for all the signs. More information on wayfinding can be found in Chapter 5 and Appendix C.

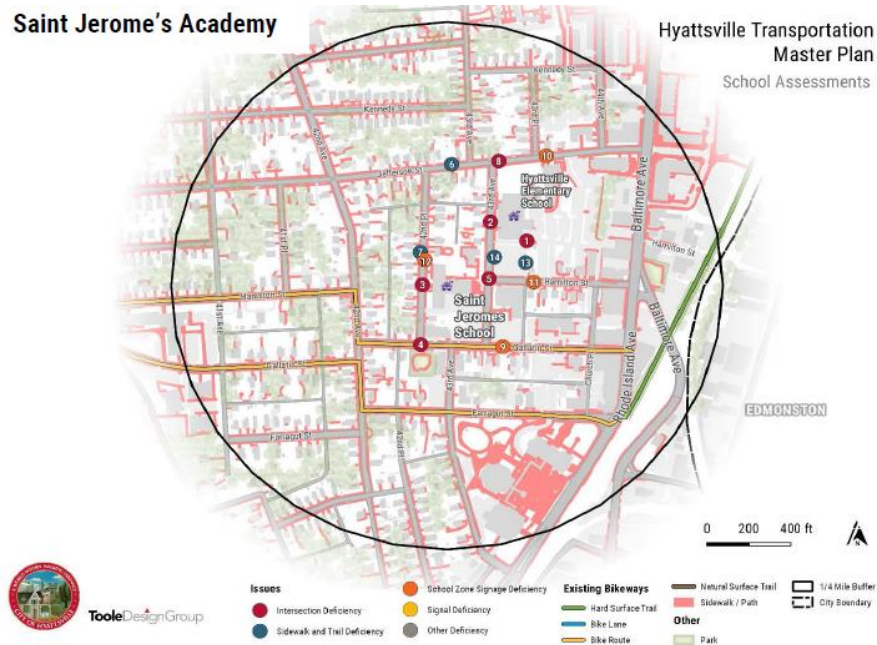


Existing Wayfinding Signs

## School Access

This Study examined access and circulation related to five elementary and middle schools in the City: Saint Jerome's Academy, Hyattsville Elementary School, Hyattsville Middle School, Edward Felegy Elementary School, and Nicholas Orem Middle School. Common issues affecting access to each school included missing or deficient curb ramps; sidewalks that are obstructed or below minimum widths, cars parked too close to intersections, relatively high vehicle speeds along major walking or biking routes, missing "School Zone" speed restriction signage, and crosswalks below minimum width standards. Additional detailed assessment of each of the school is provided in the Technical Memorandum I: Existing Conditions Report in Appendix A. Figure 2 shows the example of the school assessment for Saint Jerome's Academy.

**Figure 2 : School Area Deficiencies for Saint Jerome's Academy**  
(See Appendix A for other school assessments)



## 5. Future Transportation Needs

As the City continues to grow and evolve, so will its transportation system in both scope and in variety. The following sections describe some of the key challenges as well as the principles which form the foundation for the recommendations of this Study.

### Critical Street Connections

Hyattsville's streets are one of the city's most significant public assets. A dense network of streets is key to providing efficient traffic circulation, regardless of the mode of transportation. Impinging the circulation on any one or series of streets may result in trips diverted to other streets. Hence, one of the most effective ways to address future growth in population, employment and resulting traffic is to ensure that the Hyattsville has a policy to develop a



connected street network. This allows the city to distribute the traffic more equitably and improve the quality of life of the residents.



*Sparse street network (left image) concentrates traffic on small number of street, while dense connected street network (right image) distributes the traffic evenly and improves resiliency.*

While the City has an extensive street network, there remain missing links in the grid; particularly between East-West Highway and neighborhoods to the south, and along the Queens Chapel/Adelphi Road corridors. Likewise, the one-way streets on local corridors such as Longfellow Street create broken connections within the street network. These missing links force residents to take long, circuitous routes for short, local trips, which may encourage them to drive instead of walking or bicycling due to the additional distance. As a result, local traffic contributes to more congestion on the main roads, which already must carry through and regional traffic. Filling in some of these missing connections and turning select one-way streets into two-way streets will improve access and mobility throughout the City. This will reduce the burden on local streets while also giving people a more safe and comfortable option to travel without an automobile.

### **Future Vehicular Needs**

The overall population and employment growth of Prince George's County and the Washington DC metro area, in addition to the anticipated growth in Hyattsville, will affect travel behaviors and traffic volumes on the streets within the City. This growth will require Hyattsville to be smart and deliberate about the investments that it makes to improve the transportation system for current and future residents and businesses and makes the best use of public resources.

This Study makes several improvement recommendations at major intersections as they are critical bottlenecks in the transportation network within the City limits. However, it should be noted that a vast majority of these intersections are on County and State roadways. As such, the City does not have the authority to implement the recommended improvements and can only request changes by the responsible agency. Nonetheless, safe operations of these intersections are critically important to the residents of Hyattsville as they provide vital access to local and regional destinations. It is anticipated that Prince George's County DPWT and

Maryland SHA will take the recommended improvements into consideration in any future project for roadways.

This Study recognizes that simply adding vehicular capacity at existing roadways and intersections is not a sustainable mitigation measure as any added capacity will likely be filled by induced traffic demand created by the addition of the capacity. Furthermore, it is well understood that adding vehicular capacity by adding lanes will reduce safety for pedestrians and bicyclists while eliminating the sense-of-place of the area. Lastly, increasing capacity for motor vehicles often requires acquisition of additional right of way (which may in turn require demolishing existing structures). As such, physical improvements were identified that would a) improve vehicular safety and capacity at critical intersections without having a major negative impact on bicycle and pedestrian environment, b) improve bicycle and pedestrian environment without adding significant vehicular delay; and c) limit the need to widen roads and/or intersections. These improvements recommendations are listed in the following chapter.

#### **What is Induced Traffic?**

It is the latent traffic demand that fills any new added vehicular capacity of the roadway, which results in recurrence of congestion.

Analysis for this Study used the Metropolitan Washington Council of Governments (MWCOG) regional travel demand model data as well as site-generated trips from approved developments in Hyattsville to forecast 2032 future traffic volume at several intersections in the City. Study intersections were analyzed for the AM and PM peak hours. Intersections where the forecasted traffic growth resulted in extreme delay in the future, i.e. more than 200 seconds of average delay, were identified for future long-term improvements. This approach is taken for two main reasons; 1) The advent of transformational transportation technology will likely continue to have dramatic impact on travel behavior in the future. Thus, future traffic volume forecast is unpredictable. 2) Adding vehicular capacity to accommodate estimated future traffic growth will have substantial negative impact on the near-term pedestrian and bicycle environment, as well as the built environment and sense-of-place around the intersection.

The recommended projects in this Study include both short-term and long-term improvements at critical intersections, as described above. Appendix B provides the future intersection operational results.

### **Traffic Calming**

Residents of Hyattsville are concerned about volume and speed of traffic on neighborhood streets. With anticipated future traffic growth, especially on major roadways within the City, these issues are likely to get worse in the future. One of the key tools to address this future vehicular need is to implement a robust traffic calming policy and program. The City's current municipal code (Chapter 114 Article II, Traffic Regulations) defines traffic calming devices, procedure to request, public hearings, removal and maintenance of the devices. While the code provides many critical elements of the program, it lacks, 1) the engineering guidance on which type of device is appropriate for what type of issue, 2) definition of what constitutes a "speeding problem," and 3) definition of "sufficient volume of non-residential traffic." Absence

of these critical elements in the municipal code and the City's procedure could potentially contribute to inconsistent implementation of the traffic calming program.

One strategy used by many communities to address the speed and volume issues on a roadway, while still accommodating local trips is to identify them as bicycle boulevards (also called neighborhood slow streets). These types of streets prioritize bicycle and pedestrian modes while still accommodating local traffic, thus decreases the propensity of it being used for cut-through traffic. See the section on bicycle facility types for more detail.

### **Future Bicycle and Pedestrian Needs**

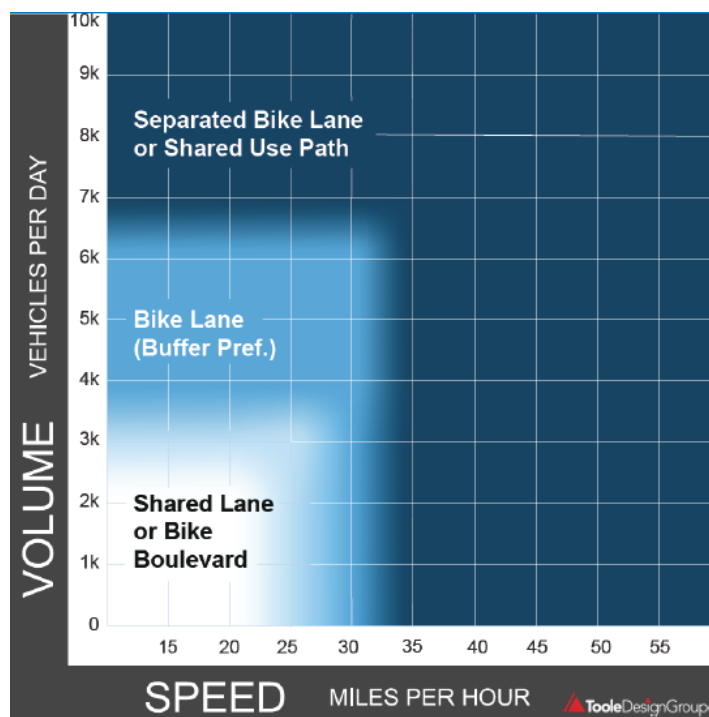
With increased development around the Metro stations and in the Gateway Arts District, it is expected that pedestrian and bicycle traffic will increase in the coming years, especially due to the proximity of these local destinations. More people may work, shop, go to school, or participate in leisure activities close to home, or make greater use of the City's public transportation assets. To reduce reliance on single-occupancy vehicle for travel, especially for short trip lengths around town, Hyattsville should invest in infrastructure that supports other modes of travel. Cities around the country are finding that developing high-quality bicycle and pedestrian facilities is having a positive impact on economic activity and investment, transportation affordability, public health and general well-being of residents.

### **Bicycle Facility Types**

The current state-of-the-practice in bicycle facility design is based on identifying vulnerable users, such as families bicycling together or children, as the design users of the facility. This means designing facilities that are safe for everyone so that families feel comfortable enough to use it. This has resulted in bicycle facility type guidance that is based on the roadway context—specifically vehicular speed and volume. Generally, bicycle facilities adjacent to high speed and volume roadways should have increased physical separation. This Study recommends bicycle facilities that are in line with this principle.

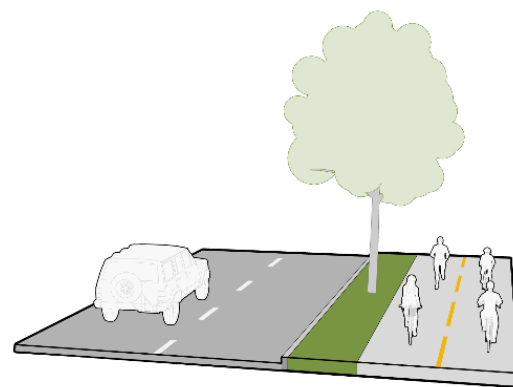
Below is a chart from the forthcoming AASHTO (American Association of State Highway and Transportation Officials) Guide for the Design of Bicycle Facilities, which provides general guidelines for designing bicycle facilities based on the roadway's speed and traffic volume. On slower streets with little traffic, it recommends that bicyclists share space with drivers, but on streets with higher speeds or greater traffic, it recommends striped bike lanes with buffers, or separated bike lanes or paths that are fully separated from motor vehicles. The following is a description of different types of bicycle facilities that may be appropriate for streets within the City.

**Figure 3 : Bicycle Facility Selection Chart**



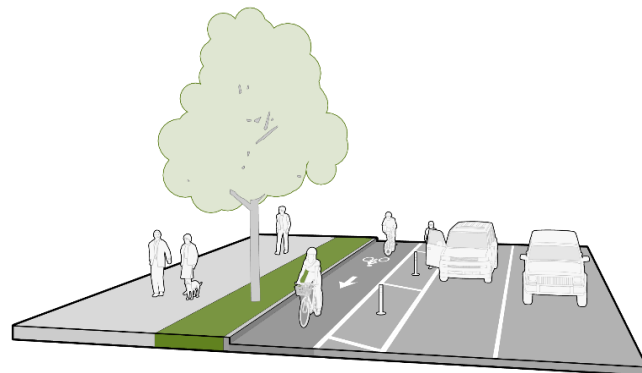
### Multiuse Paths

Multiuse paths are dedicated facilities for bicyclists and pedestrians that are typically located adjacent to high-speed roads with very few roadway or driveway crossings. They are accommodated within the rights-of-way of the roadways. They are preferred by less experienced bicyclists because of their separation from traffic. More experienced bicyclists may avoid them if pedestrians and slower bicyclists are present. Snow removal and sweeping of these paths may require specialized equipment. Additionally, tree roots growing under the pavement may require periodic maintenance to preserve a comfortably smooth pathway surface. Multiuse paths are also referred to as Shared Use Paths.



### Separated Bike Lanes

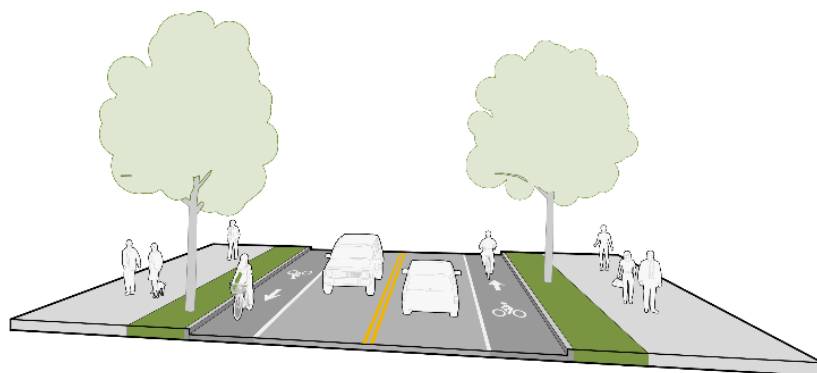
Separated Bicycle Lanes (SBLs) are on-street bicycle lanes that are physically separated from motor vehicle traffic. SBLs can be designed for one-way or two-way bicycle traffic. Additionally, they can be level with the travel lane, raised but still lower than the sidewalk, or level with the sidewalk. This bikeway type combines the user experience of a multiuse path with the on-street infrastructure of bike lanes. Separation from traffic



can be achieved with physical elements such as a lane of parallel parking, planters, curbing, or flexible posts. SBLs require added design considerations at driveways, transit stops, and intersections (especially for two-way Separated Bike Lanes) to manage conflicts with turning vehicles and crossing pedestrians. They may require bicycle-specific signals, signal phasing or protected intersection designs that slow turning vehicle speeds. Colored pavement or other visual treatments may be used to enhance visibility and raise awareness of the SBL, especially at conflict areas like driveways and intersections. Stormwater treatment is one of the considerations when installing protection such as curbs. This may be mitigated by installing pre-cast concrete blocks with drainage sleeves that allow storm water to access existing gutter and storm drain systems. Specialized street sweepers may be required to maintain narrow facilities.

### Conventional Bike Lanes

This bikeway type uses signage and striping to allocate dedicated roadway space to bicyclists. It encourages predictable movements by bicyclists and motorists. Care must be taken to properly design bike lanes to meet or exceed minimum standards, particularly for width, and to properly restrict cars from parking in them.



Substandard bike lanes may not attract riders and may not be comfortable for casual or less confident bicyclists. It is also important that bike lane treatments be carried through intersections to provide continuity and guidance for bicyclists where the potential for conflicts is highest. Where bike lanes must end due to space constrictions or must transition to another facility type, advance warning and/or wayfinding signage for an alternative route should be provided to instruct bicyclists how to proceed. Bike lanes generally need to be swept periodically to keep debris from accumulating in them, especially if they are located adjacent to a curb.

### Bicycle Boulevard

Bicycle boulevards (also referred to as neighborhood greenways or neighborhood slow streets) are low-speed, low-volume shared roadways that create a high comfort walking and bicycling environment, while still allowing local vehicle traffic. Traffic



calming or diversion treatments are often used to promote speed and volume reduction. Shared lane markings and wayfinding signs are often used to help bicyclists navigate the route and raise awareness that bicyclists are present. Bicycle boulevards also feature enhanced treatments at arterial/collector street intersections to provide safe and convenient crossings. Maintenance requirements are generally low because cars share the same space, although traffic calming elements would add maintenance needs if they are installed. Generally, roadways with an average of fewer than 3,000 vehicles per day and 25 mph speed are ideal for bicycle boulevards. If the current operating volume and speeds are higher, then traffic calming devices such as, speed humps, traffic diverters, chicanes, etc., can be installed to ensure that the operational characteristics of the roadway encourages families to ride bicycle together.

### Pedestrian Crossing Guidance

One of the main hurdles for pedestrian travel is safety at major roadway crossings. This issue was raised during public meetings and WikiMap surveys. While reducing the crossing distance by eliminating travel lanes, etc., is an ideal solution, in most instances, it is cost prohibitive. Furthermore, installing a full traffic signal with pedestrian signal heads must meet strict signal warrants established in the MUTCD (Manual on Uniform Traffic Control Devices), the federal government's standards for the design and placement of traffic signs and signals. As a result, it may not be possible to install a traffic signal at every location where pedestrians are crossing.

In order to assist pedestrian crossings at uncontrolled locations, the Federal Highway Administration (FHWA) published the *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* in 2017, which includes the guidance for pedestrian crash countermeasures based on roadway configurations, speed limits, and average daily traffic volumes, as shown in Table 3. Hyattsville should use this guideline to install safe pedestrian crossings at unsafe locations with high pedestrian crossing demand.



**Table 3 : Uncontrolled Crossing Counter Measures**  
(Source: FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations)

| Roadway Configuration        | Speed Limit         |                |                |                           |                |                |                      |                |                |
|------------------------------|---------------------|----------------|----------------|---------------------------|----------------|----------------|----------------------|----------------|----------------|
|                              | ≤30 mph             | 35 mph         | ≥40 mph        | ≤30 mph                   | 35 mph         | ≥40 mph        | ≤30 mph              | 35 mph         | ≥40 mph        |
|                              | Vehicle AADT <9,000 |                |                | Vehicle AADT 9,000–15,000 |                |                | Vehicle AADT >15,000 |                |                |
| 2 lanes*                     | 1 2 3 4<br>5 6      | 1 3<br>5 6 7   | 1 3<br>5 6 7   | 1 3 4<br>5 6              | 1 3<br>5 6 7   | 1 3<br>5 6 7   | 1 3 4<br>5 6 7       | 1 3<br>5 6 7   | 1 3<br>5 6 7   |
| 3 lanes with raised median*  | 1 2 3 4<br>5        | 1 3<br>5 7     | 1 3<br>5 7     | 1 3 4<br>5 7              | 1 3<br>5 7     | 1 3<br>5 7     | 1 3 4<br>5 7         | 1 3<br>5 7     | 1 3<br>5 7     |
| 3 lanes w/o raised median†   | 1 2 3 4<br>5 6 7    | 1 3<br>5 6 7   | 1 3<br>5 6 7   | 1 3 4<br>5 6 7            | 1 3<br>5 6 7   | 1 3<br>5 6 7   | 1 3 4<br>5 6 7       | 1 3<br>5 6 7   | 1 3<br>5 6 7   |
| 4+ lanes with raised median‡ | 1 3<br>5            | 1 3<br>5 7     | 1 3<br>5 7     | 1 3<br>5 7                | 1 3<br>5 7     | 1 3<br>5 7     | 1 3<br>5 7           | 1 3<br>5 7     | 1 3<br>5 7     |
| 4+ lanes w/o raised median‡  | 1 3<br>5 6 7 8      | 1 3<br>5 6 7 8 | 1 3<br>5 6 7 8 | 1 3<br>5 6 7 8            | 1 3<br>5 6 7 8 | 1 3<br>5 6 7 8 | 1 3<br>5 6 7 8       | 1 3<br>5 6 7 8 | 1 3<br>5 6 7 8 |

\*One lane in each direction    †One lane in each direction with two-way left-turn lane    ‡Two or more lanes in each direction

Given the set of conditions in a cell,

- ① Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- 1 High-visibility crosswalk markings, parking restriction on crosswalk approach, adequate nighttime lighting levels
- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Pedestrian Hybrid Beacon
- 8 Road Diet

This table was developed using information from: Zegeer, C. V., Stewart, J. R., Huang, H. H., Lagerwey, P. A., Feaganes, J., & Campbell, B. J. (2005). *Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines* (No. FHWA-HRT-04-100); *Manual on Uniform Traffic Control Devices*, 2009 Edition, Chapter 4F, Pedestrian Hybrid Beacons; the *Crash Modification Factors (CMF) Clearinghouse website* (<http://www.cmfclearinghouse.org/>); and the *Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE) website* (<http://www.pedbikesafe.org/PEDSAFE/>).

## Future Transit Needs

Hyattsville is served relatively well by regional transit service, including two Metro stations, Metrobus, The Bus, and UMD shuttle. However, the big data analysis as well as public input revealed that there is significant demand for travel between Hyattsville Crossing, the Gateway Arts District, and West Hyattsville. However, the current transit services do not provide direct and efficient route connecting these destinations. As such, this Study identified the need to conduct an operational and financial feasibility study to provide high-frequency shuttle service between these destinations.

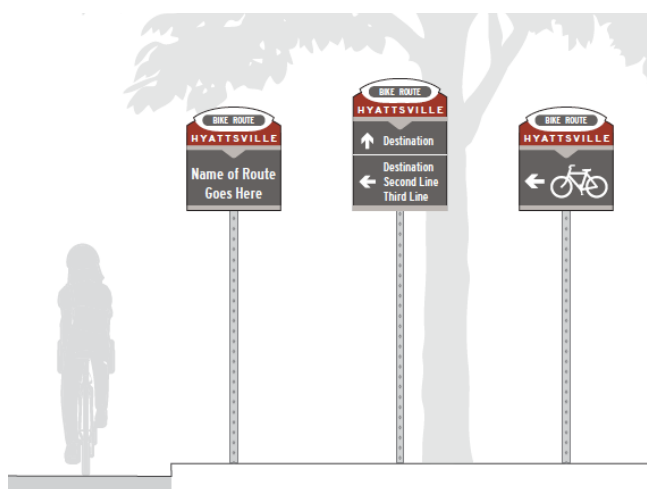
## Wayfinding Sign Design and Placement

As part of this Study, the project team worked closely with City staff to develop a set of new designs for all wayfinding signs in the City. The recommended design takes inspiration from significance of streetcars Hyattsville's transportation history and provides unique branding for the City and that enhances the sense-of-place in the community. The figure below provides the proposed design for various types of wayfinding signs. Each of the sign type is designed to provide specific information to bicyclists, pedestrians and motorists. However, they all have the same design elements to provide consistent branding and improve aesthetics.



The project team also developed installation details and as well as identified bicycle routes, sign texts and placement to assist City in installation of these signs. These details are provided in Appendix C of this Study.

**Figure 4 Proposed Wayfinding Sign Design**



*Bicycle Wayfinding Signs*



*Kiosk Sign*



*Vehicular Wayfinding*



*Sign Detail Example*

## 6. Proposed Transportation Network

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### Goals and Vision

This Study includes goals, policies, and strategies that can be used to shape public and private transportation initiatives for the next decade. Throughout the planning process, community stakeholders expressed a desire for a safer walking and bicycling experience, improved access to shops, schools, leisure activities, improved transit, and better traffic flow. The following statement describes what the City of Hyattsville will look like after the implementation of the goals expressed in this Study.

*In the near future, Hyattsville will be a place where anyone, regardless of age, background, or ability, can travel safely, comfortably, and affordably. Its transportation network will prioritize people-friendly streets that add energy and vitality to their surroundings, while accommodating the inevitable flow of traffic into and out of the City. The transportation system will support Hyattsville's sustainability goals by prioritizing active transportation for shorter trips and access to rapid transit for longer trips. Hyattsville's streets will serve as the backdrop for community events and festivals, as well as the rhythms of everyday life: traveling to school or work, running errands at a local business, enjoying a leisurely stroll or bike ride, spending time with friends, family, and loved ones.*

### Strategy Recommendations

In order to implement the above goals and vision, several strategies are recommended. The projects identified for each strategy highlight specific projects that support and advance the strategy. These projects, and several others are listed in the Project Recommendation section.

#### Strategy I: Complete the City's street grid with new street connections.

- **Project: New street between Toledo Terrace and Heurich Park Road.** A lack of street connections between East-West Highway, Ager Road, and Queens Chapel Road forces residents on long, circuitous paths to make local trips, encouraging people to drive and generating additional traffic congestion. A new street from the end of Toledo Terrace to Heurich Park Road (or 31<sup>st</sup> Avenue) will significantly improve traffic flow and circulation, particularly for local trips. The design may require incorporation of traffic calming treatments to ensure that this does not create a new traffic burden on neighborhoods. This connection would require additional analysis and a feasibility study.
- **Project: Improve the McClanahan Park connection between Jamestown Road and the Prince George's Plaza Metro station.** Today, area residents rely on informal foot paths connecting dead-end neighborhood streets south of the station to the Prince George's Plaza Metro station and shopping areas along East-West Highway. Improved sidewalk connections and a small, neighborhood-scaled plaza at McClanahan Park would make it safer, easier and more inviting to walk to the station, while providing much needed community open space.
- **Project: Public plaza connection between 33rd Avenue and Editors Park Drive.** The big data analysis showed high number of trips between the commercial developments

along East-West Highway and neighborhood to the south of Nicholson Street.

Currently, most trips between these areas are made by car. However, these trips can easily be made by foot or bicycle if safe and inviting infrastructure is present.

Neighborhoods immediately south of the Metro Green Line tracks currently rely on a handful of foot paths connecting dead-end streets south of the tracks to the Prince George's Plaza Metro station, the Mall at Prince George's, and Nicholas Orem Middle School. One of those streets is 33<sup>rd</sup> Avenue, which currently has a path connecting it to the dead-end Editors Park Drive and Orem Middle School. Turning this path into a plaza would create a new public open space, encourage more walking and biking to the mall area, in turn increasing safety with more pedestrian activity and eyes on the street.

- **Project: Connect missing links in the neighborhood street network.** Dead-end streets can impede connections for people on foot or bicycle, funnel more traffic onto the streets that do provide through-connections, and reduce accessibility for emergency vehicles. Connecting these broken links could improve access throughout the City and make it easier for people to take short trips by any mode without traveling on already burdened major roads. It is recommended the City undertake a feasibility study of connecting the following dead-end streets:
  - Calverton Drive to Dean Drive
  - Oliver Street between 42<sup>nd</sup> Place and 43<sup>rd</sup> Avenue
  - Queens Chapel Road and Manorwood Drive intersection

Furthermore, as large land parcels redevelop in the future, e.g. the Mall at Prince George's or expansion of the University Town Center, the City should consider establishing an urban street grid network to improve multimodal circulation as well as enhance the livability of the area.

It should be noted that in each case, new streets are proposed to preserve right-of-way if or when redevelopment occurs at that location. The City has no intention of seizing private property to construct these roads. New streets are intended to create access to new development, serve new residents and businesses, and improve local traffic for current residents by completing the street grid. They are not intended to encourage cut-through traffic on existing streets. All new streets should be designed to discourage cut-through traffic by incorporating traffic calming devices or via other measures.

### **Strategy 2: Design streets for lower speeds.**

- **Project: Rebuild Hamilton Street as a Complete Street between Jamestown Road and 40th Avenue.** Hamilton Street is a state highway and a major connection between the West Hyattsville Metro station, the Queens Chapel Town Center, and Magruder Park. However, it has long stretches without sidewalks, no bicycle accommodations, and has an overly wide design that encourages speeding and unsafe driving behavior. To reduce speeding and make this the east-west main street for Hyattsville that is safe and comfortable for all users, Hamilton Street should be redesigned as a Complete Street, with bike lanes, ample and continuous sidewalks, additional pedestrian crossings and narrower motor vehicle lanes and potentially other traffic calming measures. This will

require coordination with SHA and potential opportunity for the City taking over control and ownership of the street from the SHA after the reconstruction. The design should consider the new police station on Hamilton and emergency responders ability to navigate the street.

- **Project: Rebuild Toledo Road as a Complete Street between Toledo Place and Adelphi Road.** Toledo Road is a local street within the Prince George's Plaza Transit District but currently lacks continuous sidewalks or bicycle accommodations for its entire length. Working in conjunction with the owners of the Mall at Prince George's and University Town Center, rebuild this street as a Complete Street with sidewalks, bike lanes, and a two-lane street section.

### Strategy 3: Prioritize people on foot in street design.

- **Project: Complete missing links in the sidewalk network.** Sidewalks are a crucial part of making it easy, comfortable, and safe to walk in the City, particularly around major destinations such as the Metro stations and Arts District. While the City has an extensive sidewalk network, there remain several blocks in those areas currently lack complete or accessible sidewalks on one or both sides of the street. New sidewalks are recommended in the following locations:
  - Along 38<sup>th</sup> Avenue between from Hamilton Street to Northwest Branch Trail
  - Along 41<sup>st</sup> Avenue between Nicholson Street and Oglethorpe Street
  - Along the south side of Maryhurst Drive between Madison Street and Madison Place
  - Along the Oliver Street right-of-way between 42<sup>nd</sup> Avenue and 42<sup>nd</sup> Place
- **Project: Complete off-street links in the sidewalk and trail network.** In areas with dead-end or discontinuous streets, there are opportunities for off-street trail connections that can leverage the existing sidewalk network to dramatically improve access for people traveling on foot. Multi-use paths are recommended in the following locations:
  - Between Northwestern High School and Toledo Terrace or Belcrest Road
  - Between Nicholas Orem Middle School and 34<sup>th</sup> Avenue (upgrade existing path to accessible standards)
  - Between Nicholas Orem Middle School and the intersection of 35<sup>th</sup> Avenue and Oliver Street
  - Between First Baptist Church and the intersection of 42<sup>nd</sup> Place and Macaroy Alley
- **Project: Create safer pedestrian crossings citywide.** Many intersections in high-traffic areas, such as near transit stops, schools, or shopping areas currently lack high-visibility crosswalks that indicate to drivers where to stop and tell people crossing on foot, especially those with disabilities, where they can do so safely. Other intersections have wide turning radii that encourage drivers to speed, giving them less time to react to the presence of people crossing the street. It is recommended the City create pedestrian-friendly intersections through the provision of high-visibility crosswalks and curb extensions, where appropriate, throughout Hyattsville. Taking advantage of

reconstruction and development opportunities to strategically improve intersections is encouraged. Every pedestrian crossing that is made safer and more comfortable will enhance and the pedestrian network and increase the walkability of the City.

- **Project: Update and implement traffic calming program.** City's current traffic calming policy and program lays a strong foundation to build an effective program. The policy should be updated to define important parameters that are critical for its successful implementation, like excessive speed and non-residential traffic. In addition, the program should be updated to include guidance on effectiveness and implementation of traffic control devices. Traffic calming should be implemented on following streets:
  - 3900 block of Jefferson Street
  - Queensbury Road

#### **Strategy 4: Reduce the number of one-way streets.**

- **Project: Convert one-way to two-way streets or change circulation.** One-way streets are common on Hyattsville's narrower streets, particularly around the Arts District and in Hyattsville Hills. However, some one-way streets can increase traffic congestion by forcing drivers to take long, circuitous routes, impede travel by not providing a route for a return trip, and even encourage speeding on streets with excess width. Additional discussion about one-way streets and how they relate to the City's street network can be found in Chapter 5. The City should change traffic circulation on the following streets:
  - Hamilton Street – convert to two-way from Route 1 to 43<sup>rd</sup> Ave
  - Hamilton Street – convert to two-way from 40<sup>th</sup> Avenue to 42<sup>nd</sup> Avenue
  - Farragut Street – convert to two-way from 42<sup>nd</sup> Avenue to access to the Prince George's County Services Complex.
  - Jefferson Street – convert to two-way or reverse one-way from 35<sup>th</sup> Avenue to Queens Chapel Road
  - Oglethorpe Street – convert to two-way from 42<sup>nd</sup> Place to 44<sup>th</sup> Avenue
  - Jamestown Road – convert to two-way from 31<sup>st</sup> Avenue to Lancer Drive

#### **Strategy 5: Prioritize the comfort of people on bikes in street design.**

- **Project: Create bike boulevards on lower-speed streets that could provide key bicycling connections but are too narrow for bike lanes.** Nearly all of the City is within a comfortable bicycling distance of major destinations, such as the Metro stations, the Prince George's Plaza transit district, or the Gateway Arts District. Most neighborhood streets lack bicycle accommodations but are too narrow to accommodate dedicated bike lanes or would require parking removal for their installation. Many of these streets are ideal for a bike boulevard, which uses signs, pavement markings and traffic calming to create a low-speed street that is comfortable for bicycling. Bike boulevards can also help address speeding and discourage cut-through traffic through traffic calming. It is recommended that the City convert the following streets to bike boulevards:
  - Jamestown Road between Ager Road and Oliver Street
  - Jefferson Street between 40<sup>th</sup> Avenue and Baltimore Avenue

- Nicholson Street between Ager Road and Queens Chapel Road
- Oglethorpe Street between Queens Chapel Road and Baltimore Avenue
- 40<sup>th</sup> Avenue between Hamilton Street and 41<sup>st</sup> Avenue
- 41<sup>st</sup> Avenue between 40<sup>th</sup> Avenue and Queens Chapel Road
- **Project: Provide separated bike lanes on Belcrest Road and Toledo Terrace.** Belcrest Road and Toledo Terrace are important local connections within the Prince George's Plaza Transit District and are home to thousands of residents in recently-constructed multi-family buildings. However, both streets currently lack safe bicycle accommodations. Separated bike lanes on both streets would be a key part of the City's bicycle network. Note: a portion of Toledo Terrace lies outside of the boundaries of the City of Hyattsville, however, the City should advocate for this work to be completed as the only access to Toledo Terrace is by using roads within the City.
- **Project: Provide separated bike lanes (or multi-use path) on Adelphi Road.** Adelphi Road is a key north-south connection between the Prince George's Plaza area and communities adjacent to the City, including the University of Maryland and the Town of University Park. Providing separated bike lanes on this corridor would create an alternative to driving into the City for short trips, reducing traffic volumes and parking needs in the transit district. It is recommended separated bike lanes (or multi-use path) are installed on Adelphi Road from Queens Chapel Road to City limits. As this road is owned by SHA, coordination with the State Highway Administration and a feasibility study would be required to explore potential street sections and configurations.
- **Project: Install multi-use path on East-West Highway.** East-West Highway is a key east-west connection through the City (owned by SHA), but is largely inaccessible to people traveling by bike. There are currently no bicycle facilities on or parallel to this street, which is the primary connection across the Northwest Branch of the Anacostia River to points west. Due to the high traffic volume and speed on the roadway, even protected bicycle lane is not anticipated to feel safe for many users. Hence, a high-quality, separated multi-use path is recommended along the roadway. A multi-use path on the north side of East-West Highway would improve access to the Mall at Prince George's, University Town Center, and the Prince George's Plaza Metro station. It is recommended the City work with SHA to provide a multi-use path on the north side of East-West Highway from 23<sup>rd</sup> Avenue to Adelphi Road.

**Strategy 6: Design intersections to improve safety for all.**

- **Project: Redesign the intersection of Baltimore Avenue (Route 1, Route 1 Alternate), and Hamilton Street.** This intersection forms the southern gateway to the Gateway Arts District, as well as a key connection over the MARC tracks. However, it experiences significant backups on Route 1 Alternate and Hamilton Street, and is very difficult for people to cross on foot. Converting Hamilton from a one-way eastbound to a one-way westbound street and adding a new southbound left-turn lane can reduce backups, while also improving circulation for Hyattsville Elementary School and St. Jerome Academy. Tightening the geometry of the intersection can improve the

pedestrian connection. Redesigning this intersection can be an opportunity to create a more welcoming entrance to Hyattsville's section of Route 1.

- **Project: Reconfigure intersections on East-West Highway to reduce delay for all users and improve the crossing experience for pedestrians and bicyclists.** While East-West Highway serves regional traffic, it is also the spine of the Prince George's Plaza Transit District and, as a result, must accommodate the needs of nearby residents, including those taking short trips. Long traffic signal cycles not only cause backups on side streets but create unacceptable delays for people walking or bicycling. The lane configuration and signal timing for these six intersections should be updated to improve its operation (see Project Recommendation section for specific recommendations):
  - East-West Highway and Toledo Terrace
  - East-West Highway and Editors Park Drive
  - East-West Highway and Belcrest Road
  - East-West Highway, Queens Chapel Road, and Adelphi Road
  - East-West Highway and Baltimore Avenue (Route 1)
- **Project: Install single-lane modern roundabout at the 40th Avenue, Gallatin Street & Hamilton Street intersection.** The intersection is one of the key entrances to Magruder Park and the historic residential areas of Hyattsville. Furthermore, the five approaches of the intersection make it an ideal candidate for a roundabout.
- **Project: Reconfigure intersections to improve safety.** In order to improve safety at intersections, the lane configuration can be modified to reduce turning vehicle speed and pedestrian crossing distances, while ensuring that vehicular operation is not deteriorated considerably. This can be achieved by eliminating turn lanes where it is not necessary, updating traffic signal phasing and timings, etc. Lane configuration changes are recommended at the following intersections (see Project Recommendation section for specific recommendation):
  - Route 1 and Farragut Street
  - Ager Road and Hamilton Street
  - Queens Chapel Road, Queensbury Road, and Belcrest Road
- **Project: New traffic signals at critical intersections such as Baltimore Avenue (Route 1 Alternate) and Charles Armentrout Drive.** Charles Armentrout Drive is an important local connection between Rhode Island Avenue and industrial activities on Baltimore Avenue (Route 1 Alternate). Currently, the intersection of Armentrout Drive and Baltimore Avenue is uncontrolled and has dangerously poor sight distance, which creates significant backups, particularly for traffic turning left (north) from Armentrout Drive to Baltimore Avenue. A traffic signal would improve traffic flow and safety while creating a safe grade-level crossing for people on foot or bicycle. Baltimore Avenue is a state route, so this project would require coordination with SHA.
- **Project: New traffic signals on Ager Road at Lancer Drive and Nicholson Street.** The Ager Road road diet (reducing pavement width) currently being built by Prince George's County DPWT is intended to calm speeding on Ager Road and make it safer to cross between the West Hyattsville Metro station, the Queens Chapel Town Center, and



surrounding residential areas. New traffic signals at Lancer Drive and Nicholson Street will create safer crossings for people on foot or bike, while improving circulation within the neighborhoods. A Lancer Drive signal will also create access to the new residential development currently under construction west of the Metro station. As Ager Road is a County route, this would require coordination with Prince George's County DPWT.

- **Project: Study the feasibility of a new traffic signal at East-West Highway and America Boulevard as part of future development of the area.** As University Town Center builds out, the need for additional access from East-West Highway will increase, particularly for people on foot or bicycle. A signalized intersection with future redevelopment that require full access (instead of existing right-in/right-out access), would allow people additional access to this development and improve connections to the Prince George's Plaza Metro station. As East-West Highway is a state route, coordination with SHA and a feasibility study should analyze the potential effects of a new traffic signal on adjacent intersections.
- **Project: New traffic signals on Queens Chapel Road at Lancer Drive and Nicholson Street.** Queens Chapel Road is currently home to the longest stretch in the City without a signalized intersection, measuring 1.5 miles. People on foot or bike must travel far out of their way to cross at a signal or risk their safety crossing against the light. Two new traffic signals at Lancer Drive and Nicholson Street will create safer crossings, calm traffic by reducing the ability to gain speed between lights and improve circulation between residential areas in the City. (A signal at the intersection of Queens Chapel Road and Nicholson Street is currently under design by SHA.)

#### **Strategy 7: Prioritize connections to and from the Metro stations and Arts District**

- **Project: Working with private property owners, develop a new street network around the Prince George's Plaza Transit District.** Today, the areas around the Prince George's Plaza Metro station are largely characterized by large, privately-owned developments with long blocks, and limited pedestrian or bicycle connections. The University Town Center and Editors Park developments both include a network of local streets designed to provide more internal connectivity. Long-term plans to expand University Town Center and redevelop the Mall at Prince George's should include additional street connections to the grid, including the following links:
  - Editors Park Drive between East-West Highway and Toledo Terrace
  - Freedom Way between Toledo Terrace and Belcrest Road
  - America Boulevard between East-West Highway and Queens Chapel Road
  - America Boulevard between Toledo Road and Belcrest Road
- **Project: Work with private property owners to develop a new street network around the West Hyattsville Metro station.** A new residential development is currently under construction on the north side of the station that will include several new, private streets connecting to Ager Road. On the south side of the station, long-term plans call for extending Hamilton Street and Jamestown Road, and providing additional street connections between Ager Road and Queens Chapel Road. Hyattsville

should work with WMATA, PG DPWT and future developers to incorporate new street connections with short blocks and frequent crossings.

- **Project: Conduct feasibility study to assess the viability of establishing a shuttle service between the Metro Stations and the Arts District.** The big data analysis and public input clearly indicated the high travel demand between these areas in the city. The City should evaluate the financial and operational feasibility of establishing a shuttle service between these destinations.

**Strategy 8: Integrate trails into the local transportation network.**

- **Project: Install pedestrian/bicycle actuated traffic control devices on the Northwest Branch Trail where it crosses major streets, including Queens Chapel Road and 38th Street, and East-West Highway.** These devices give people traveling on foot or bike a safe way to cross busy roads. These intersections should be analyzed either for rectangular rapid flashing beacon or High Intensity Activated Crosswalk (HAWK) signal, also known as a pedestrian hybrid beacon.

## Project Recommendations

The comprehensive data collection and analysis, as well as several rounds of public engagement conducted as part of this Study, identified several key multimodal mobility challenges within Hyattsville. This ranged from lack of adequate pedestrian facilities around schools, opportunities to improve multimodal circulation throughout the City, opportunities to improve bicycle travel within the City, lack of consistent wayfinding signs, and the opportunity to establish shuttle service. The table below lists the all of the recommended projects for this Study. A map of the recommended projects can be found on page 48.

**Figure 5 : Project Recommendations**

| Project ID | Category                     | Project Name                                                    | Description                                                                                                                                                                                           |
|------------|------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BB-1       | Bike boulevard               | Jefferson Street Bike Blvd (40th Ave to Trolley Trail)          | Designate and design as bike boulevard to improve east-west bicycle connectivity                                                                                                                      |
| BB-2       | Bike boulevard               | Nicholson Street Bike Blvd (Ager Rd to 40 <sup>th</sup> Avenue) | Designate and design as bike boulevard to improve east-west bicycle connectivity                                                                                                                      |
| BB-3       | Bike boulevard               | Jamestown Road Bike Blvd (Ager Rd to Oliver Rd)                 | Designate and design as bike boulevard as alternate to bicycling on Queens Chapel Road                                                                                                                |
| BB-4       | Bike boulevard               | 40th/41st Avenue Bike Blvd                                      | Designate and design as bike boulevard to connect Magruder Park to East-West Highway and beyond                                                                                                       |
| BB-5       | Bike boulevard               | Oglethorpe Street Bike Blvd                                     | Designate and design as bike boulevard to improve east-west bicycle connectivity                                                                                                                      |
| BP-1       | Bicycle/Pedestrian Actuators | NW Branch Trail Crossing at 38th Street                         | Install Rectangular Rapid Flashing Beacon (RRFB), raised crossing, or High Intensity Activated Crosswalk (HAWK) signal                                                                                |
| BP-2       | Bicycle/Pedestrian Actuators | NW Branch Trail Crossing at Queens Chapel Road                  | Redesign to reduce crossing distance and install a High Intensity Activated Crosswalk (HAWK) signal                                                                                                   |
| CC-1       | Circulation Change           | Gallatin Street two-way conversion                              | Convert to two-way from 42nd Ave to Route 1                                                                                                                                                           |
| CC-2       | Circulation Change           | Hamilton Street one-way flip                                    | Convert EB one-way to WB one-way from 43rd Ave to Route 1                                                                                                                                             |
| CC-3       | Circulation Change           | Circulation change implementation                               | Review additional proposed circulation changes and determine timeline for implementation                                                                                                              |
| I-1        | Intersection                 | Route 1, Route 1-Alt & Hamilton Street (south) Improvement      | Redesign intersection to add SBLT lane and new WBTH movement. Consider converting the signal at Hamilton St (north) intersection to stop-controlled to improve north-south vehicular flow in the area |
| I-2        | Intersection                 | 40th Avenue, Gallatin Street, & Hamilton St. Roundabout         | Install roundabout to improve traffic flow, safety, and gateway treatment to City's core                                                                                                              |
| I-3        | Intersection                 | East-West Highway & Toledo Terrace Improvement                  | Restripe SB and NB approaches to provide separate LT and shared TH-RT lanes. Remove WBRT lane to reduce pedestrian crossing distance                                                                  |
| I-4        | Intersection                 | East-West Highway & Editor's Park Drive Improvement             | Consider removing EBRT lane due to low turning volume and to reduce pedestrian crossing distance                                                                                                      |
| I-5        | Intersection                 | East-West Highway & Belcrest Road improvement                   | Consider reconfiguring to exclusive dual NBLT and single SBLT lanes to improve vehicular operation                                                                                                    |

| Project ID | Category      | Project Name                                                                    | Description                                                                                                                                                                                                                          |
|------------|---------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I-6        | Intersection  | East-West Highway, Queens Chapel Road, & Adelphi Rd Improvements                | Consider realigning the NS approaches to intersect at closer to 90° and provide exclusive NBLT and SBLT lanes to improve vehicular operation                                                                                         |
| I-7        | Intersection  | East-West Highway & Route 1 Improvement                                         | Consider providing dual westbound left-turn lanes                                                                                                                                                                                    |
| I-8        | Intersection  | Queens Chapel Road & Queensbury Road-Belcrest Road                              | Consider restricting movement to right-in/right-out/left-in as the last option to reduce cut-through traffic on Queensbury Road                                                                                                      |
| I-9        | Intersection  | Route 1 and Farragut Street Reconfiguration                                     | Consider consolidating two eastbound lanes to one to reduce pedestrian crossing distance.                                                                                                                                            |
| I-10       | Intersection  | Ager Road & Hamilton Street Reconfiguration                                     | Consider reconfiguring WB approach to shared LT-TH and TH-RT lanes due to low through volume and to reduce pedestrian crossing distance                                                                                              |
| MU-1       | Multiuse Path | East-West Highway Multiuse Path (Toledo Terrace to 23rd Avenue)                 | Install multi-use trail on north side instead of bike lanes, eliminate continuous right turn lane                                                                                                                                    |
| MU-2       | Multiuse Path | East-West Highway Multiuse Path (Toledo Terrace to Adelphi Road)                | Install multi-use trail on north side instead of bike lanes, eliminate continuous right turn lane                                                                                                                                    |
| MU-3       | Multiuse Path | Northwestern High School Multiuse Trail Connection                              | Construct multiuse path between Northwestern HS fields and Toledo Terrace or Belcrest Road, or through future Landy Property development                                                                                             |
| NS-1       | New street    | Toledo Terrace to Heurich Park Road Connection                                  | Study alternative routes for the new street connection to improve circulation and reduce congestion on East-West Hwy. A portion of this road would lie outside the City limits and requires coordination with Prince George's County |
| NS-2       | New street    | Editors Park Drive Connection from East-West Highway to Toledo Road             | Build future Complete Street grid network as part of any future redevelopment of the area                                                                                                                                            |
| NS-3       | New street    | Freedom Way Connection from Toledo Terrace to Belcrest Road                     | Build future Complete Street grid network as part of any future redevelopment of the area                                                                                                                                            |
| NS-4       | New street    | 38th Street extension from current terminus to Queens Chapel Rd & Manorwood Dr. | Construct two lane roadway with sidewalks to alleviate traffic on Nicholson St and 40th Ave and improve local connection                                                                                                             |
| NS-5       | New street    | Calverton Drive extension to Dean Drive                                         | Construction two lane roadway with sidewalks and bike lanes to provide multimodal connection                                                                                                                                         |
| NS-6       | New street    | Oliver Street extension from 43rd Avenue to 42nd Place                          | Construction two lane roadway with sidewalks to assist with traffic circulation in the neighborhood                                                                                                                                  |
| NS-7       | New street    | New street network around the West Hyattsville Metro station                    | Build future Complete Street grid network as part of any future redevelopment of the area                                                                                                                                            |
| NS-8       | New street    | America Boulevard between East-West Highway and Queens Chapel Road              | Build future Complete Street grid network as part of any future redevelopment of the area                                                                                                                                            |
| NS-9       | New street    | America Boulevard extension from Toledo Road to Belcrest Road                   | Build future Complete Street grid network as part of any future redevelopment of the area                                                                                                                                            |

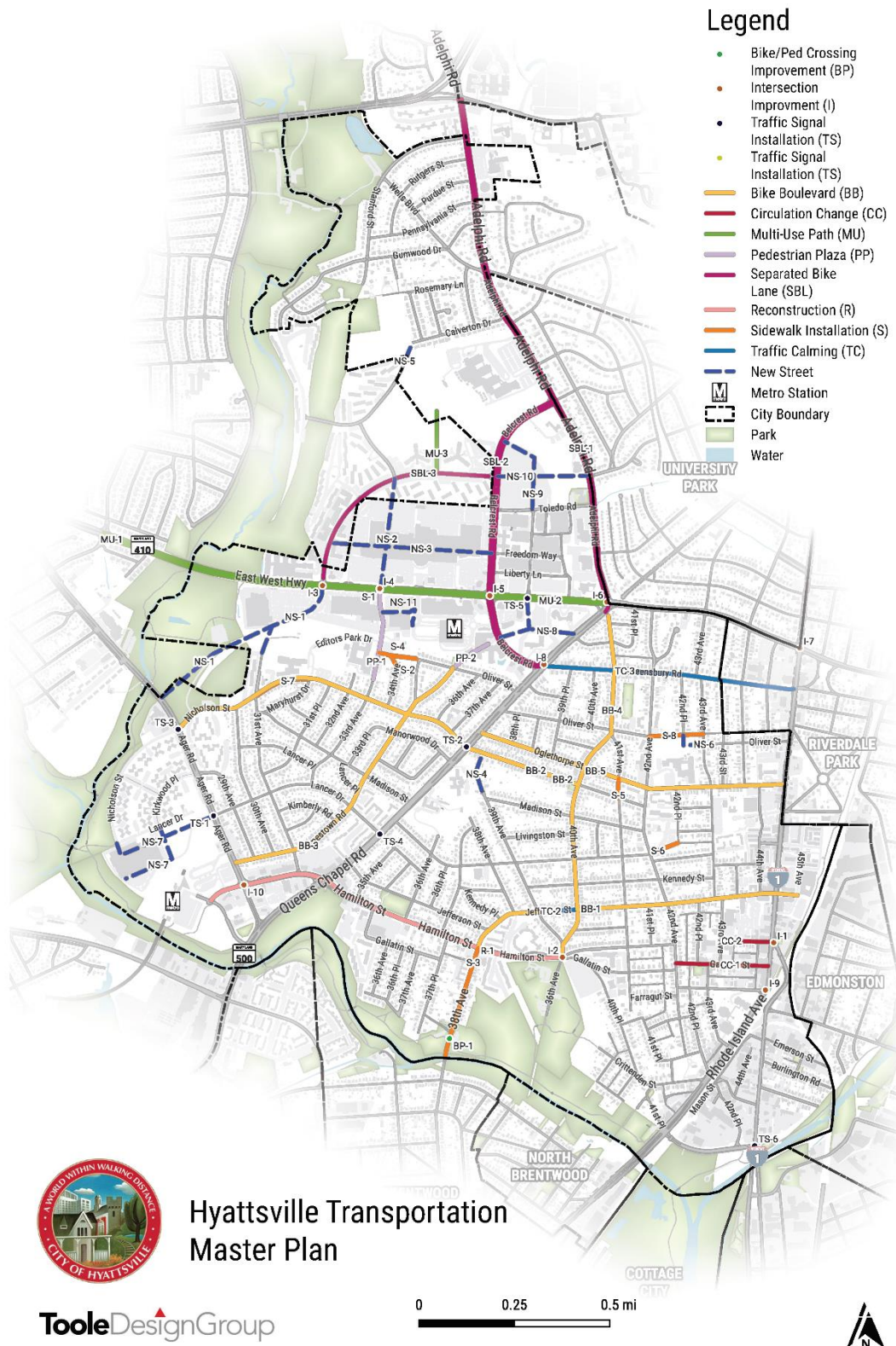
| Project ID | Category              | Project Name                                                                       | Description                                                                                                                                                                                  |
|------------|-----------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NS-10      | New street            | Toledo Terrace extension between Belcrest Road and Adelphi Road                    | Build future Complete Street grid network as part of any future redevelopment of the area                                                                                                    |
| NS-11      | New street            | Sentinel Drive between Editors Park Drive and Prince George's Plaza Metro entrance | Build future Complete Street grid network as part of any future redevelopment of the area                                                                                                    |
| PC-1       | Pedestrian Crossings  | Citywide pedestrian improvements                                                   | Install curb extensions, high-visibility crosswalks, Rectangular Rapid Flashing Beacon (RRFB), pedestrian hybrid beacons, where appropriate                                                  |
| PP-1       | Pedestrian Plaza      | 33rd Avenue to Editors Park Drive Plaza                                            | Construct public plaza connection between 33rd Avenue and East-West Highway                                                                                                                  |
| PP-2       | Pedestrian Plaza      | McClanahan Park                                                                    | Construct plaza/wider sidewalk/trail from Jamestown Rd to Prince George's Plaza Metro station at McClanahan Park                                                                             |
| SBL-1      | Separated Bike Lanes  | Adelphi Road Separated Bike Lanes                                                  | Install Separated Bike Lanes (or multi-use trail) from East West Highway to city limit                                                                                                       |
| SBL-2      | Separated Bike Lanes  | Belcrest Road Separated Bike Lanes                                                 | Install Separated Bike Lanes (or multiuse path) from Adelphi Rd to Queens Chapel Rd)                                                                                                         |
| SBL-3      | Separated Bike Lanes  | Toledo Terrace Separated Bike Lanes                                                | Install Separated Bike Lanes from Belcrest Rd to EW Highway                                                                                                                                  |
| R-1        | Reconstruction        | Hamilton Street Complete Street Design and Construction                            | Work with the State to redesign as a Complete Street to enhance east-west connection for people traveling on foot or bike from West Hyattsville Metro to Magruder Park and the Arts District |
| R-2        | Reconstruction        | Toledo Road Complete Street Design and Construction                                | Design and build Complete Street from Adelphi Road to Toledo Place                                                                                                                           |
| S-1        | Sidewalk installation | East-West Highway to mall at Editors Park Drive                                    | Work with developer to create accessible entrance to mall                                                                                                                                    |
| S-2        | Sidewalk installation | 34th Avenue to Middle School Ped Connection                                        | Install accessible pathway connecting Nicholas Orem Middle School to 34th Avenue                                                                                                             |
| S-3        | Sidewalk installation | 38th Avenue Sidewalk from Hamilton Street to Northwest Branch Trail                | Install missing sidewalk (could require additional ROW on either side)                                                                                                                       |
| S-4        | Sidewalk installation | Oliver Street Ped connection to Orem Middle School                                 | Build accessible path to Oliver Street behind baseball field connecting to existing stairs, ROW exists on south side for a new path                                                          |
| S-5        | Sidewalk installation | 41st Avenue Sidewalk from Nicholson Street to Oglethorpe Street                    | Construct new sidewalk                                                                                                                                                                       |
| S-6        | Sidewalk installation | 42nd Place to 42nd Ave Ped Connection near Macaroy Street                          | Consider building pathway connecting 42nd Place to First Baptist Church                                                                                                                      |
| S-7        | Sidewalk installation | Maryhurst Drive Sidewalk installation                                              | Install new sidewalk on the south side of Maryhurst Drive                                                                                                                                    |
| S-8        | Sidewalk installation | Oliver Street Sidewalk between 42nd Avenue and 43rd Avenue                         | Construct sidewalk within the existing ROW                                                                                                                                                   |

| Project ID | Category        | Project Name                                           | Description                                                                                                                                                                |
|------------|-----------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SS-1       | Streetscape     | Various streets                                        | Strengthen the pedestrian environment by widening sidewalks, installing street furniture, improving lighting, discouraging the use of slip lanes and right turn only lanes |
| TC-1       | Traffic Calming | Revamp the traffic calming program                     | Update the current program in the municipal code to include specific guidance on volume and speed thresholds                                                               |
| TC-2       | Traffic Calming | 3900 Block of Jefferson Street Traffic Calming         | Install curb extension on the NW corner of 38 <sup>th</sup> St/ Jefferson St intersection and other measures to discourage cut-through traffic                             |
| TC-3       | Traffic Calming | Queensbury Road Traffic Calming                        | Install traffic calming devices to discourage cut-through traffic                                                                                                          |
| TS-1       | Traffic signal  | Ager Road and Lancer Drive Traffic signal              | Install traffic signal to improve operation and safety for all users                                                                                                       |
| TS-2       | Traffic signal  | Queens Chapel Road and Nicholson Street Traffic Signal | Install traffic signal to improve operation and safety for all users                                                                                                       |
| TS-3       | Traffic signal  | Ager Road and Nicholson Street Traffic Signal          | Conduct signal warrant analysis and improve pedestrian safety                                                                                                              |
| TS-4       | Traffic signal  | Queens Chapel Road and Lancer Drive Traffic Signal     | Install traffic signal to improve operation and safety for all users                                                                                                       |
| TS-5       | Traffic signal  | East-West Highway and America Boulevard Traffic Signal | Potential future signal as part of area redevelopment                                                                                                                      |
| TS-6       | Traffic signal  | Route 1 Alternate and Armentrout Drive Traffic Signal  | Install traffic signal to improve operation and safety for all users                                                                                                       |
| WF-1       | Wayfinding      | Wayfinding Overhaul                                    | Install new wayfinding signs on bicycle boulevards and major destinations                                                                                                  |

EB: Eastbound; WB: Westbound; NB: Northbound; SB: Southbound; LT: Left-Turn; RT: Right-Turn; TH: Through



**Figure 6 :Map of Recommended Projects**





## 7. Implementation

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There are several important transportation projects across the City of Hyattsville that would have a meaningful impact on accessibility, mobility, and quality of life. However, the City cannot build everything all at once, and must invest wisely in projects that can have the largest impact while effectively addressing stated goals. Many of the improvements will require coordination with other parties including SHA, Prince George's DPWT, and private developers/property owners. To find the projects that the City should place emphasis on, each of the 61 recommended projects were ranked on a 23-point scale, using the following metrics based on the six Speak Up! HVL goals. Each metric was allocated a point on 1-5 scale based on its compatibility with the Study's vision, with 5 being the highest point. These metrics are:

1. **Improve safety on major roads.** Projects that meet this requirement will make it safer for people travel within the City by a variety of modes. (4 points)
2. **Safer connectivity for pedestrians.** Projects that meet this requirement will improve access for people traveling on foot, with an emphasis on completing missing links in the sidewalk and trail network and improving crossings of busy roads. (5 points)
3. **Improve traffic flow within neighborhoods.** Projects that meet this requirement will reduce the number of circuitous local trips that add unnecessary traffic on residential streets, while creating new opportunities for people on foot or bike to make short trips safely and comfortably. (3 points)
4. **Strengthen connectivity for cyclists.** Projects that meet this requirement will improve access for people traveling by bicycle, with an emphasis on completing missing links in the bicycling network and improving crossings of busy roads. (5 points)
5. **Support the Metro stations and Gateway Arts District.** Projects that meet this requirement will support pedestrian-, bicycle-, and transit-friendly development in the City's three activity centers, by making it easier to travel to and from them without a car. An emphasis is placed on projects within a half-mile of the West Hyattsville Metro station, Prince George's Plaza Metro station, and Gateway Arts District. (4 points)
6. **Support sustainable growth.** Projects that support metrics 2, 4, and 5 will receive an extra point for supporting environmentally, socially, and economically sustainable development within the City. (2 points).

This system can be used by the City in the future to rate other transportation projects that arise, allowing officials to make wise decisions about which investments to make.

### Top scoring projects

The following projects scored towards the top of the list for transportation investments. These projects address the City's sustainability goals, as well as significant travel issues that residents, workers, and visitors currently face. They can impact many people's access and mobility within the City within a short period of time.

**Figure 7 :Top 20 Scored Projects**

| Project ID | Category              | Project Name                                                                    | Speak Up HVL<br>Priorities    |                                   |                               |                                      |                             |                    | Total Points |
|------------|-----------------------|---------------------------------------------------------------------------------|-------------------------------|-----------------------------------|-------------------------------|--------------------------------------|-----------------------------|--------------------|--------------|
|            |                       |                                                                                 | Improve safety on major roads | Safe connectivity for pedestrians | Traffic flow in neighborhoods | Strengthen connectivity for cyclists | Support Metro/Arts District | Sustainable growth |              |
| R-1        | Reconstruction        | Hamilton Street Complete Street Design and Construction                         | ✓                             | ✓                                 | ✓                             | ✓                                    | ✓                           | ✓                  | 23           |
| NS-1       | New street            | Toledo Terrace to Heurich Park Road Connection                                  | ✓                             | ✓                                 | ✓                             | ✓                                    | ✓                           | ✓                  | 23           |
| BP-1       | Bike/Ped Crossing     | NW Branch Trail Crossing at 38th Street (MD 208) south of Gaines Alley          | ✓                             | ✓                                 |                               | ✓                                    | ✓                           | ✓                  | 20           |
| BP-2       | Bike/Ped Crossing     | NW Branch Trail Crossing at Queens Chapel Road (MD 500) south of Jamestown Road | ✓                             | ✓                                 |                               | ✓                                    | ✓                           | ✓                  | 20           |
| I-1        | Intersection          | Route 1, Route 1-Alt & Hamilton Street (south) Improvement                      | ✓                             | ✓                                 |                               | ✓                                    | ✓                           | ✓                  | 20           |
| I-2        | Intersection          | 40th Avenue, Gallatin Street, & Hamilton St. Roundabout                         | ✓                             | ✓                                 |                               | ✓                                    | ✓                           | ✓                  | 20           |
| MU-1       | Multiuse Path         | East-West Highway Multiuse Path (Toledo Terrace to 23rd Avenue)                 | ✓                             | ✓                                 |                               | ✓                                    | ✓                           | ✓                  | 20           |
| MU-2       | Multiuse Path         | East-West Highway Multiuse Path (Toledo Terrace to Adelphi Road)                | ✓                             | ✓                                 |                               | ✓                                    | ✓                           | ✓                  | 20           |
| PP-1       | Pedestrian Plaza      | 33rd Avenue to Editors Park Drive Plaza                                         |                               | ✓                                 | ✓                             | ✓                                    | ✓                           | ✓                  | 19           |
| TS-1       | Traffic signal        | Ager Road and Lancer Drive Traffic signal                                       |                               | ✓                                 | ✓                             | ✓                                    | ✓                           | ✓                  | 19           |
| TC-1       | Traffic Calming       | Revamp the traffic calming program                                              | ✓                             | ✓                                 | ✓                             | ✓                                    |                             |                    | 17           |
| TC-2       | Traffic Calming       | 3900 Block of Jefferson Street Traffic Calming                                  | ✓                             | ✓                                 | ✓                             | ✓                                    |                             |                    | 17           |
| TC-3       | Traffic Calming       | Queensbury Road Traffic Calming                                                 | ✓                             | ✓                                 | ✓                             | ✓                                    |                             |                    | 17           |
| TS-2       | Traffic signal        | Queens Chapel Road and Nicholson Street Traffic Signal                          | ✓                             | ✓                                 | ✓                             | ✓                                    |                             |                    | 17           |
| TS-3       | Traffic signal        | Ager Road and Nicholson Street Traffic Signal                                   | ✓                             | ✓                                 | ✓                             | ✓                                    |                             |                    | 17           |
| TS-4       | Traffic signal        | Queens Chapel Road and Lancer Drive Traffic Signal                              | ✓                             | ✓                                 | ✓                             | ✓                                    |                             |                    | 17           |
| BB-1       | Bike boulevard        | Jefferson Street or Gallatin Street Bike Blvd (40th Ave to Trolley Trail)       | ✓                             |                                   | ✓                             | ✓                                    | ✓                           |                    | 16           |
| PP-2       | Pedestrian Plaza      | Jamestown Road Plaza                                                            |                               | ✓                                 |                               | ✓                                    | ✓                           | ✓                  | 16           |
| R-2        | Reconstruction        | Toledo Road Complete Street Design and Construction                             | ✓                             | ✓                                 |                               | ✓                                    |                             | ✓                  | 16           |
| S-1        | Sidewalk installation | East-West Highway to Mall at Editors Park Drive                                 |                               | ✓                                 |                               | ✓                                    | ✓                           | ✓                  | 16           |

## Sequential Action Plan

Planning, obtaining funding and implementing projects from design to construction require a considerable level of effort from City Staff. This report aims to provide the City with the information to make educated decisions not only about what to implement, but how to implement.

The top 20 projects that will have the most impact on the City of Hyattsville and help reach the transportation goals are listed and ranked above in Table 5. The ranking should serve as guidance for the City, and the projects should be implemented as groups if geographically practical and if funding allows. A planning level cost estimate for each recommended priority project is included in Appendix D of the report. A planning level cost estimate is essential for budgeting City funds toward these projects and for informing negotiations with future land developers.

Several projects, specifically the new street projects, are intended to be implemented as a part of future development. With these projects, the City can be specific in discussion with future developers and ensure that their development plan accommodates City's recommended projects. The earlier and clearer the request, the more likely a developer can include it in their plan. The new streets are not the only projects that can be implemented by developers. Other projects that are on or adjacent to their site may be negotiated into their project with their preliminary plan approvals. Often the new development will warrant the addition of a traffic signal and new signal priority projects should be give precedence. This can be especially important on projects that require SHA and DPW&T approval. The developer's experience in these areas can be very valuable. The recommended projects in this transportation plan aim to make Hyattsville a more vibrant and active City which in-turn makes developers properties more profitable.

However, the City cannot solely rely on developers to fund and implement all of the changes that will meet the transportation goals and vision for the City. Development is controlled by the market and although collaboration can be mutually beneficial, the City loses control over the timeline of design and construction. The City will need to implement projects through their Capital Improvement Programs and apply for additional funding through grants. A planning level cost estimate has been prepared for each recommended project and is included in Appendix D.

When implementing projects, it may make sense for the City to consider grouping projects by project type, by geography, or by corridor (or some combination of the three). Similarly, there may be occasions where two or more projects must be implemented simultaneously or in close succession to achieve full benefit and functionality. The following table provides a proposed grouping of projects for the sequential action plan. Projects with the same Group Number in the first column make sense to be implemented as a package of projects, rather than in isolation. This proposed grouping does not preclude the City from taking other approaches (e.g. completing all sidewalk installation projects as part of one City-wide contract) and should be revisited from time to time to confirm the groupings still make sense.

**Table 6 : Suggested Project Groups**

| Groups | Project ID | Category              | Project Name                                                                       |
|--------|------------|-----------------------|------------------------------------------------------------------------------------|
| 1      | R-1        | Reconstruction        | Hamilton Street Complete Street Design and Construction                            |
|        | I-10       | Intersection          | Ager Road & Hamilton Street Reconfiguration                                        |
| 2      | I-3        | Intersection          | East-West Highway & Toledo Terrace Improvement                                     |
|        | NS-1       | New street            | Toledo Terrace to Heurich Park Road Connection                                     |
|        | SBL-3      | Separated Bike Lanes  | Toledo Terrace Separated Bike Lanes                                                |
| 3      | BP-1       | Bike/Ped Crossing     | NW Branch Trail Crossing at 38th Street (MD 208) south of Gaines Alley             |
|        | BP-2       | Bike/Ped Crossing     | NW Branch Trail Crossing at Queens Chapel Road (MD 500) south of Jamestown Road    |
| 4      | CC-1       | Circulation Change    | Gallatin Street two-way conversion                                                 |
|        | CC-2       | Circulation Change    | Hamilton Street one-way flip                                                       |
|        | CC-3       | Circulation Change    | Circulation Change Implementation                                                  |
|        | I-1        | Intersection          | Route 1, Route 1-Alt & Hamilton Street Improvement                                 |
|        | I-9        | Intersection          | Route 1 and Farragut Street Reconfiguration                                        |
| 5      | I-2        | Intersection          | 40th Avenue, Gallatin Street, & Hamilton St. Roundabout                            |
|        | TS-6       | Traffic signal        | Route 1 Alternate and Armentrout Drive Traffic Signal                              |
| 6      | I-4        | Intersection          | East-West Highway, Queens Chapel Road, & Adelphi Rd Improvements                   |
|        | MU-1       | Multiuse Path         | East-West Highway Multiuse Path (Toledo Terrace to 23rd Avenue)                    |
|        | MU-2       | Multiuse Path         | East-West Highway Multiuse Path (Toledo Terrace to Adelphi Road)                   |
| 7      | PP-1       | Pedestrian Plaza      | 33rd Avenue to Editors Park Drive Plaza                                            |
|        | PP-2       | Pedestrian Plaza      | Jamestown Road Plaza                                                               |
|        | NS-10      | New street            | Sentinel Drive between Editors Park Drive and Prince George's Plaza Metro entrance |
| 8      | NS-7       | New street            | New street network around the West Hyattsville Metro station                       |
|        | TS-1       | Traffic signal        | Ager Road and Lancer Drive Traffic signal                                          |
|        | TS-4       | Traffic signal        | Queens Chapel Road and Lancer Drive Traffic Signal                                 |
| 9      | TC-1       | Traffic Calming       | Revamp the traffic calming program                                                 |
|        | TC-2       | Traffic Calming       | 3900 Block of Jefferson Street Traffic Calming                                     |
|        | TC-3       | Traffic Calming       | Queensbury Road Traffic Calming                                                    |
| 10     | TS-2       | Traffic signal        | Queens Chapel Road and Nicholson Street Traffic Signal                             |
| 11     | BB-2       | Bike boulevard        | Nicholson Street Bike Blvd from Ager Rd to 40th Ave                                |
|        | BB-3       | Bike boulevard        | Jamestown Road Bike Blvd from Ager Rd to Oliver Rd                                 |
|        | S-7        | Sidewalk installation | Nicholson St Sidewalk installation                                                 |
|        | TS-3       | Traffic signal        | Ager Road and Nicholson Street Traffic Signal                                      |

| Groups | Project ID | Category              | Project Name                                                              |
|--------|------------|-----------------------|---------------------------------------------------------------------------|
| 12     | BB-1       | Bike boulevard        | Jefferson Street or Gallatin Street Bike Blvd (40th Ave to Trolley Trail) |
|        | BB-4       | Bike boulevard        | 40th/41st Avenue Bike Blvd                                                |
|        | BB-5       | Bike boulevard        | Oglethorpe Street Bike Blvd                                               |
|        | S-3        | Sidewalk installation | 38th Avenue Sidewalk from Hamilton St to Northwest Branch Trail           |
|        | S-5        | Sidewalk installation | 41st Avenue Sidewalk from Nicholson Street to Oglethorpe St               |
|        | S-6        | Sidewalk installation | 42nd Place to 42nd Ave Ped Connection near Macaroy Street                 |
|        | S-8        | Sidewalk installation | Oliver Street Sidewalk between 42nd Avenue and 43rd Avenue                |
| 13     | NS-2       | New street            | Editors Park Drive Connection from East-West Highway to Toledo Road       |
|        | NS-3       | New street            | Freedom Way Connection from Toledo Terrace to Belcrest Road               |
|        | R-2        | Reconstruction        | Toledo Road Complete Street Design and Construction                       |
|        | S-1        | Sidewalk installation | East-West Highway to mall at Editors Park Drive                           |
| 14     | NS-10      | New street            | Toledo Terrace extension between Belcrest Road and Adelphi Road           |
|        | NS-9       | New street            | America Boulevard extension from Toledo Road to Belcrest Road             |
|        | I-5        | Intersection          | East-West Highway & Belcrest Road improvement                             |
|        | SBL-1      | Separated Bike Lanes  | Adelphi Road Separated Bike Lanes                                         |
|        | SBL-2      | Separated Bike Lanes  | Belcrest Road Separated Bike Lanes                                        |
| 15     | I-7        | Intersection          | East-West Highway & Route 1 Improvement                                   |
| 16     | NS-8       | New street            | America Boulevard between East-West Highway and Queens Chapel Road        |
|        | I-6        | Intersection          | East-West Highway, Queens Chapel Road, & Adelphi Rd Improvements          |
|        | I-8        | Intersection          | Queens Chapel Road & Queensbury Road-Belcrest Road                        |
|        | TS-5       | Traffic signal        | East-West Highway and America Boulevard Traffic Signal                    |
| 17     | NS-4       | New street            | 39th Avenue extension from Madison Street to Nicholson Street             |
|        | NS-6       | New street            | Oliver Street extension from 43rd Avenue to 42nd Place                    |
| 18     | MU-3       | Multiuse Path         | Northwestern High School Multiuse Trail Connection                        |
|        | NS-5       | New street            | Calverton Drive extension to Dean Drive                                   |
| 19     | S-2        | Sidewalk installation | 34th Avenue to Middle School Ped Connection                               |
|        | S-4        | Sidewalk installation | Oliver Street Ped connection to NO Middle School                          |
| 20     | PC-1       | Pedestrian Crossings  | Citywide pedestrian improvements                                          |
|        | SS-1       | Streetscape           | Various streets                                                           |
| 21     | WF-1       | Wayfinding            | Wayfinding Overhaul                                                       |

## Implementation Strategy

To implement the various projects, the Study recommends that the City partake in the following approaches:

### Establish quarterly working session with SHA, DPW&T and other implementing agencies

As many of the major projects within Hyattsville are on facilities owned by regional entities, it is important to establish regular meetings with the agencies to ensure that the priorities identified

by the City are included in their annual projects. Working with implementing agencies early in the process allows the project scope of work to address Hyattsville concerns. For example, any future project on East-West Highway in Hyattsville should evaluate the feasibility to build multi-use path along the corridor, as identified by this Study.

#### Identify Initial Projects to Implement

Of the top 20 projects listed in Table 5, depending on the funds available, identify handful of projects to implement in the next few budget cycles. It should be noted that some of the projects may benefit from collaboration between different departments in order to pool funds allocated to the departments. For example, Community and Economic Development Department may be interested to be part of updating wayfinding signs that will help improve the streetscape.

Once the project has been identified, review the recommended project list in Table 4 to note projects that are in the same geography which may benefit from economies of scale for being included in the project. For example, if a new traffic signal project is approved, including sidewalks or wayfinding signs within a block of the location will ensure the best and most optimal use of scarce public resources.

#### Identify Priority Area to Implement in Alternate Budget Cycle

The City currently has several programs in the Capital Improvement Plan, including sidewalk and roadway improvement, ADA compliance, lighting improvements, and residential signage, among others. While these funds are essential to address critical infrastructure needs in all areas of the City, it might be more impactful to focus the implementation of the funds in priority areas of the City in alternate budget cycle. The priority area may be established by evaluating the total need of the area versus the availability of funds for the budget cycle. This method of fund allocation allows regular maintenance of other areas of the City to occur in budget cycle when the funds are not allocated to the priority areas.

#### Enhance Existing Annual Sidewalk Improvement Program

Based on extensive sidewalk deficiencies identified in the Study, Hyattsville can provide more funding to improve existing sidewalks and meet ADA and state requirements. In order to meet the sustainability goals of the City, the sidewalk improvement program should be enhanced to include streetscape and stormwater improvement such that the livability of the project area is improved.

## 8. Conclusion

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Over the past year, the Study Team has worked with community members and City of Hyattsville officials and staff to develop a vision for a place where streets are not simply a way to get through the City, but an opportunity to enrich the daily life of the City's residents, businesses, and visitors. Through extensive public input, research, data collection, and analysis, the Study Team identified the transportation challenges facing the City, including gaps in the pedestrian and bicycle network that make it difficult to walk or bike, delays from congestion at major intersections during rush hour, concerns with high-speed cut-through traffic on local streets, and a need for better wayfinding to provide clear direction to travelers and visitors.

From this, the Study Team identified a list of goals for improving the transportation system, building upon the vision laid out by the Speak Up HVL! Community Sustainability Plan:

- Improve safety along major roads
- Enhance and increase safe connectivity for pedestrians
- Improve traffic flow within neighborhoods
- Strengthen connectivity for cyclists
- Support development around the Metro stations and Gateway Arts District
- Support environmentally friendly, sustainable growth

These six goals form the basis for a set of policies that will guide the City as it further invests in its transportation system. These policies will help the City determine what projects to fund and construct, which transportation modes to prioritize in each location or setting, and articulate its transportation needs to the County and State, which are responsible for some of the larger roads within City limits. These policies were used to create a list of 61 transportation projects that the City can execute in the coming years. A 23-point scale, using metrics derived from the six Speak Up HVL! Goals, was created to rank each of these projects, producing a list of 20 top priority projects that could have a transformative impact on travel in Hyattsville.

This Study will serve as a guide to shaping and investing in Hyattsville's transportation system in the coming years. It will help the City build a transportation system that works for everyone, regardless of age, mobility, or transportation mode. It will help the City support anticipated growth and investment, improve and maintain existing transportation infrastructure, carry out new projects, and determine priorities for the next twenty years. Additionally, it will affirm the City's goals to become a more socially, economically, and environmentally sustainable place.

This Study reflects a broader, nationwide shift in rethinking the way people move, considering all modes of transportation, not just moving automobiles, and casting our public streets as places where people can play a more active role in their community. With these recommendations in hand, the City can work with Prince George's County, the State of Maryland, and other entities to make the right investments in its transportation system. Finally, this Study also allows Hyattsville to accommodate future growth, and the transportation



challenges that come with it, in a way that enriches existing communities while supporting the creation of new places that people will love and cherish.



# Hyattsville Transportation Study

TECHNICAL MEMORANDUM I

Existing Conditions Report

February 25, 2018

Prepared by:  
**Toole**DesignGroup

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## I. Introduction

Over the past several years, the City of Hyattsville has conducted several studies to address several transportation concerns facing the City. These studies independently evaluated numerous topics including vehicular traffic counts, pedestrian and bicycle accessibility, as well as policy analysis. Within this context, the City secured the services of Toole Design Group (TDG) and its partners to prepare a city-wide transportation study that builds on previous studies and incorporates an analysis of existing conditions. The final transportation plan will provide recommendations for improvements to the transportation network for all modes (motor vehicle, bicycle and pedestrian). This Plan will help the City improve and maintain existing transportation infrastructure, carry out new projects, and determine priorities for the next 20 years. This memorandum provides a summary of existing conditions related to the transportation modes which will inform recommendations that advance the City's transportation goals.

The document is organized in eight sections: Sections 1 and 2 provide a synopsis of citywide transportation characteristics, and a summary of past plans that are pertinent to this Study. The subsequent sections provide baseline conditions based on field observations (Section 3), a summary of public feedback received via online crowdsourcing map (Section 4); school area circulation and access (Section 5); and traffic conditions (Sections 6 and 7).

### City Characteristics

Incorporated in 1886, the City of Hyattsville is located just over one mile from the District of Columbia, and is one of the oldest incorporated municipalities within Prince George's County, Maryland. With over 18,000 residents (according to the latest U.S. Census estimates) the City has experienced an increase in population since the late 1990's. This is due in part to its transit connections, and proximity to activity and job centers throughout the region.

Hyattsville has two metro stations within city limits served by the WMATA Green Line. Prince George's Plaza and West Hyattsville Metrorail stations average around 5,000 and 8,000 riders per weekday respectively, according to WMATA.<sup>1</sup> The City is also served by a number of WMATA and The Bus (Prince George's County bus service) regional and local bus lines. The Riverdale MARC Station, just east of the City, provides commuter rail connections between Baltimore and Washington, D.C.

The City has a network of narrow low-speed local roadways and larger regional roadways - some of which dissect the city and act as barriers for walking and biking. While most roadways are owned and maintained by the City, four major roadways are owned and maintained by the Maryland State Highway Administration (SHA). These include, Baltimore Avenue/ Rhode Island Avenue, US1-A (Baltimore Avenue); East-West Highway (MD 410); Queens Chapel Rd (MD 500); and parts of Hamilton Street (MD 208). Ager Road and Adelphi Road are the main roadways owned and maintained by the Prince George's County Dept. of Public Works and Transportation (DPWT).

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<sup>1</sup>WMATA ridership data Sept 2010 – February 2016

The Northwest Branch Trail runs along the Anacostia River in southern and western Hyattsville. This provides regional bicycle and pedestrian connectivity to Washington, D.C. and Montgomery County, MD through the Anacostia Tributary Trail System which is maintained by the Maryland National Capital Park and Planning Commission – Prince Georges County (MNCPPC-PG). Additional details on existing conditions related to the roadway network are in Sections 3 through 7 of this memo.

## 2. Review of Past Studies

To provide baseline information about local standards and procedures, the Study Team conducted a literature review of past studies and plans. This section provides a summary of major outcomes and projects along a number of important transportation corridors affecting the comfort and connectivity of all modes throughout the City. The following plans were reviewed as part of this study:

### I. 2010 Citywide Traffic Study and Transportation Plan

The 2010 Transportation Plan, prepared by Sabra, Wang & Associates, Inc., collected and analyzed data on the City's existing and projected future transportation network. The Plan also developed a computer model of the City's street network, including roadway geometry, traffic volumes, and traffic control including traffic signal timing and phasing. The study covered three phases:

- Traffic data collection and existing conditions analysis
- Citywide traffic study and transportation plan
- Wayfinding services

The document identified short- and long- term strategies for 1) reducing congestion; 2) enhancing mobility and safety for all modes; 3) improving inter-modal connections; and 4) minimizing the impact on residential streets. The future conditions portion of the study projected:

- An increase of 3,000 am peak and 4,000 pm peak vehicle trips due to increased developments by year 2030.
- A more than 30 percent increase in daily traffic on State and County roads related to new developments in adjacent municipalities.
- Several intersections with LOS E or F during peak hours on State and County roads.

Related to connectivity and safety, the Plan also noted that few streets provide continuous east-west connections within Hyattsville (only two: Queensbury Road and Hamilton Street/40th Place/Crittenden Street). These streets currently carry mainly local traffic, but could experience increases from non-local traffic if State and County routes are at capacity.

Finally, the Plan called for the following short-term improvements:

- Develop and implement a Safe Routes to School program for Hyattsville Elementary
- Install speed cameras to increase compliance with posted speed limits in school zones:
  - US 1 at Farragut Street, Jefferson Street, Hamilton Street and/or Madison Street (St. Jerome's, Hyattsville Elementary, DeMatha)
  - MD 410 East-West Highway between Belcrest Road and Editor's Park Drive (Nicholas Orem, Concordia Lutheran)
  - 42nd Avenue at Oglethorpe Street (Hyattsville Middle)

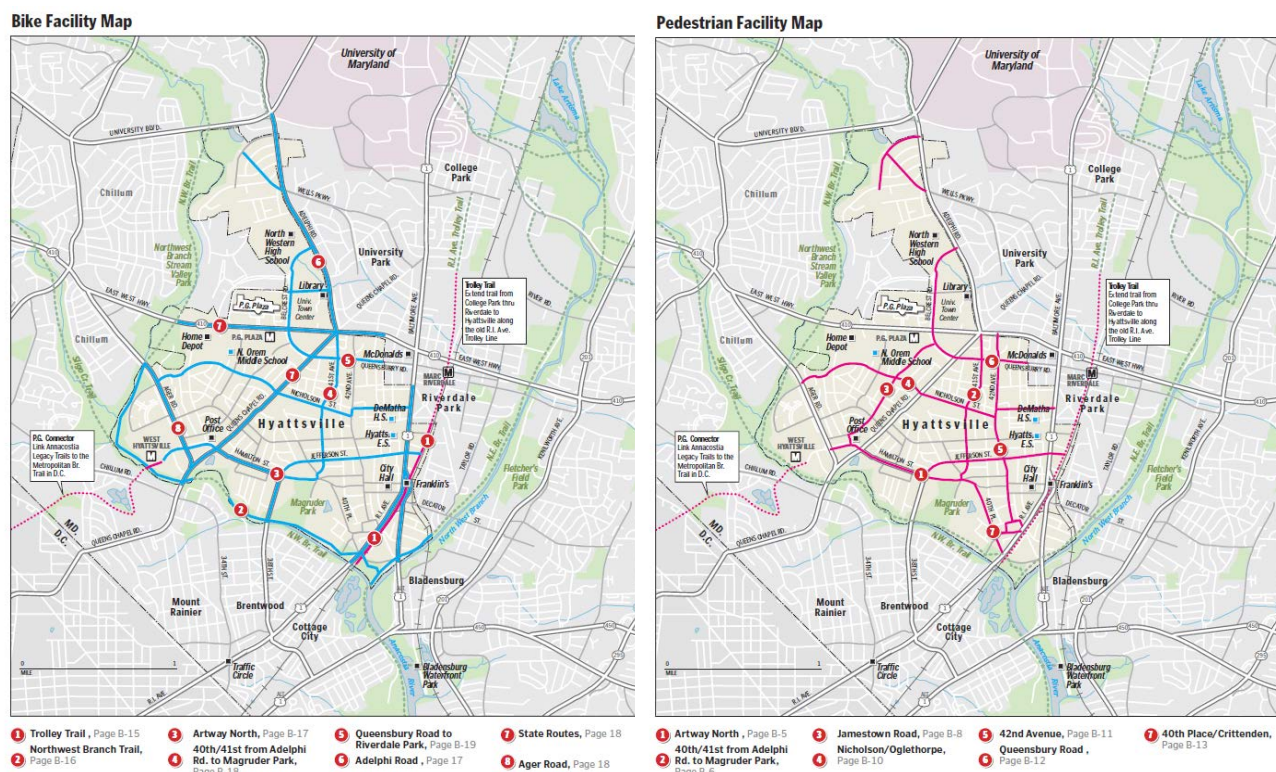
- o Adelphi Rd between Belcrest Road and Wells Parkway (Northwestern High School.
  - o Ager Road at Nicholson (West Hyattsville Elementary)
- Install new bicycle/pedestrian actuators:
  - o MD 208/ 38th Street south of Gaines Alley
  - o MD 500/ Queens Chapel south of Jamestown Road
- Install new sidewalks along 38<sup>th</sup> Avenue and Hamilton Street
- Work with WMATA to upgrade high-volume bus stops on Hamilton and 38<sup>th</sup> and East-West Highway and Toledo Terrace
- Work with SHA to finalize design and implementation of Queens Chapel Road streetscaping and crossings
- Work with SHA to review signal phasing/timing at
  - o Queens Chapel Road at Queensbury Road/ Belcrest Road
  - o US I from US I Alternate to East-West Highway
- Install access restrictions along Lancer Drive east of Queens Chapel Road to discourage cut-through traffic.
- Improve key pedestrian crossings at
  - o Adelphi Road at Wells Parkway
  - o Ager Road at Nicholson Street
  - o East-West Highway at Queens Chapel Road
  - o Queens Chapel Road at Queensbury Road
- Develop proposed cross-sections, signing and marking for implementation of key bicycle corridor connections (shared lanes, painted lanes, shoulder use, etc.)
  - o Adelphi Road and 40th Street/ Sheridan St (University Park) parallel to Adelphi Road
  - o Rhode Island Avenue Trolley Trail (US I)
  - o Ager Road
  - o Queens Chapel Road and/ or Jamestown Road parallel to Queens Chapel Road
- Intersection improvements to mitigate failing level of service
  - o US I Alternate at Armentrout Drive
  - o Ager Road at Nicholson Street, Ager Road at Lancer Drive
  - o Queens Chapel Road at Lancer, Longfellow, Jefferson, Madison, Manorwood, Nicholson, Oglethorpe and Oliver Streets

## 2. 2008 Pedestrian and Bicycle Study

This plan was developed by the Hyattsville Bicycle and Pedestrian Safety Committee which was established in 2006 and is comprised of residents and public officials. The six main recommendations of the plan pertain to:

- Designating pedestrian routes (see figure below)
- Establishing and/or improving bike routes (see figure below)
- Pursuing major intersection safety improvements
- Ensuring well-lit streets
- Making ADA-compliant pedestrian access a high priority
- Implementing city-wide sidewalk standards

**Figure I: Proposed Bicycle and Pedestrian Routes**



Several corridors were designated bicycle and pedestrian routes and as such received several recommendations which were then prioritized into three tiers: 1) urgent, 2) important, 3) not immediate. The following projects received the highest prioritization based on safety concerns:

- 38<sup>th</sup> Avenue sidewalk installation (Hamilton to Northwest Branch Trail)
- 41<sup>st</sup> Avenue Intersection with Queensbury
- Artway North pedestrian and bicycle improvements
- 40<sup>th</sup> and 41<sup>st</sup> Avenue pedestrian route improvements
- Belcrest at East-West Hwy intersection improvements
- Belcrest at Queens Chapel intersection improvements
- Jamestown Road pedestrian route improvements
- Northwest Branch Trail at US I intersection
- Northwest Branch Trail at Queens Chapel intersection improvements
- Northwest Branch Trail re-designation as a M-NCPPC commuter route and lighting of the trail
- Trolley Trail installation parallel to US I on old trolley right-of-way, North of the Flatiron Building.

### **3. 2014 West Hyattsville Pedestrian Safety Study**

The West Hyattsville Pedestrian Safety Study, completed by The Traffic Group in 2014, focused on assessing pedestrian safety along the following roadways:

- Ager Road
- MD 500 – Queens Chapel Road
- Hamilton Street (west of MD 500)
- MD 208 – (Hamilton Street/ 38<sup>th</sup> Street)

The study provided an overview of the crash history, followed by a breakdown of incidents, and their specific locations. Majority of the recommendations in the study focused on providing adequate signage, sidewalk maintenance and ADA compliance of the roadways.

Some of the major improvements recommended along these corridors included:

- MD 208 – (Hamilton Street/ 38<sup>th</sup> Street)
  - o Install new sidewalks at 3600 block and 3508 Hamilton Street,
  - o Install adequate sidewalk and ramps on three commercial entrances on the south side of intersection with 35<sup>th</sup> Avenue.

### **4. 2015 City of Hyattsville Customer Preference Survey: Shopping and Parking Preferences**

This survey, completed by the City in 2015, was conducted to better understand behaviors of residents and visitors to Gateway Arts District in Hyattsville. The survey asked questions related to demographics, reasons for spending time in the District, parking habits, transportation modes, and desired improvements. Relevant findings included:

- 36 percent of respondents park their car in the District weekly
- 8.9 percent of respondents desire improved sidewalks and street lighting in the District
- 18 percent of respondents desire more convenient parking in the District
- 3.4 percent of respondents desire more frequent/reliable bus service in the District
- 5.1 percent of respondents desire bikeshare stations
- Proximity of parking to destination is more important than lower parking rates
- “Other” transportation modes used to visit Hyattsville:
  - o Bike/scooter: 16.1 percent
  - o Walking: 10.6 percent
  - o Bus: 32 percent
  - o Metro 12.7 percent
  - o Just car: 22.3 percent
  - o Other: 6.9 percent

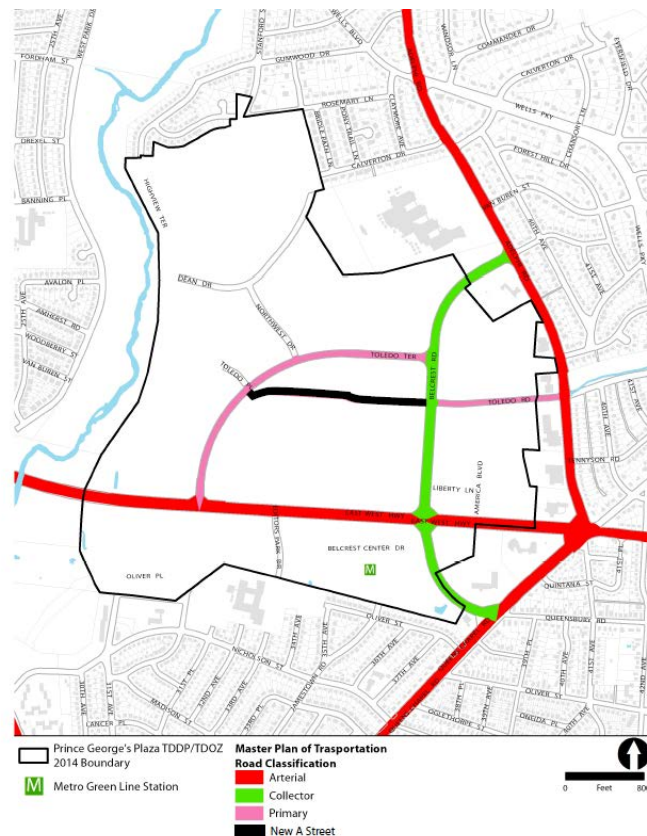


## 5. Prince George's Plaza Transit District Development Plan

This Plan completed by MNCPPC-PG in July 2016, focused on amending and providing updates to the Prince George's Plaza Transit District. This update guides and coordinates development around the existing Prince Georges Plaza Metro station - focusing development under three main themes: 1) Smart Growth; 2) Placemaking; and, 3) Fostering healthy communities. Directly related to transportation, the plan:

- Establishes a policy and regulatory framework that promotes walkable transit-oriented, mixed-use development.
- Transforms the underutilized Prince George's Plaza Metro Station and auto-oriented MD 410 (East West Highway) by integrating and connecting the Metro station with development to the north and transforming the roadway into a pedestrian- and bike-friendly boulevard.
- Recognizes the importance of the natural environment—specifically the Northwest Branch Stream Valley Park and Wells Run—and incorporates best planning and development practices to ensure a comprehensive and sensitive approach to environmental stewardship, neighborhood compatibility, and pedestrian and bicycle connectivity.

**Figure 2: Existing and Proposed Streets and Road**



Recommendations of importance to the Transportation Study include:

- Restripe MD 410 to implement the road-diet concept.
- Install traffic signal at the MD 410/America Boulevard and MD 410/Editors Park Drive intersections.
- Evaluate and implement (if feasible) a protected bike lane on MD 410.
- Consider the use of bike boxes at all signalized intersections with dedicated bike facility.
- Increase bicycle and pedestrian connections to neighborhoods south of the Transit District.
- Create a formal bicycle and pedestrian connection between multifamily properties on the northern side of the Transit District and Northwestern High School.
- Extend Toledo Road as two-lane street with on-street parking and bicycle accommodation between Belcrest Road and Toledo Terrace.



- Add interim bike lanes on Toledo Terrace. Replace bike lane with on-street parking after Toledo Road is extended to Toledo Terrace.
- Construct a hard surface trail between Adelphi Road/Toledo Road and Northwest Drive/Dean Drive intersections.
- Construct a hard surface trail from Toledo Terrace to the Northwest Branch Trail via Toledo Place.
- Design and construct a bicycle facility on or adjacent to MD 410 between Toledo Terrace and 23<sup>rd</sup> Avenue, including connection to the Heurich Park and Northwest Branch Trail.
- Construct a series of bicycle facilities along Belcrest Road.
- Evaluation of 30-mph speed limit on MD 410 – pending SHA/DPW&T approval and implementing a 25-mph speed limit on all other local roads.
- Strengthening the pedestrian environment by the widening of sidewalks (where appropriate), installing street furniture, increasing wayfinding, improving lighting, discouraging the use of slip lanes and right-turn only lanes.

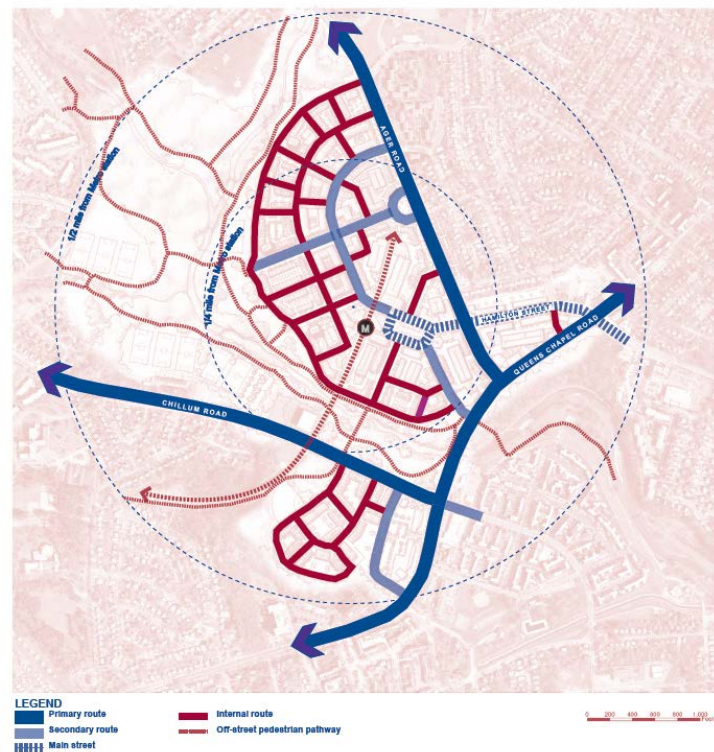
## 6. West Hyattsville Transit District Development Plan

This Plan, completed by MNCPPC-PG in July 2006, focused on providing updates to the existing West Hyattsville Transit District Overlay Zone. Three main themes guided the development of the plan: 1) maintaining existing neighborhoods; 2) environmental stewardship, and 3) increase transportation options.

The document provides a set of specific streetscape standards, and recommendations related to design and type of parking. It also delineated the character and function of a various roadways throughout the West Hyattsville area (see figure below). Ager Road, Queens Chapel Road and Chillum Road were identified as primary transportation routes.

The Plan also provided conceptual recommendations related to the internal connectivity of the street network within the Transit District.

**Figure 3: Proposed Street Typology**



## 7. Gateway Arts District Sector Plan

The plan amended the 1994 *Approved Master Plan and Sectional Map Amendment for Planning Area 68* and the 2002 *Prince George's County Approved General Plan*. The Sector Plan was developed by MNCPPC-PG and designated 'Artway Routes' to help make a number of streets connecting to Route 1 (Baltimore Avenue) corridor more inviting. The Plan also called for the installation of traffic calming throughout the Arts District routes to provide more comfortable facilities for bicyclists and pedestrians. The following three corridors were identified as "Artway Routes" connecting the West Hyattsville Metro Station to the Route 1 (Baltimore Avenue) corridor:

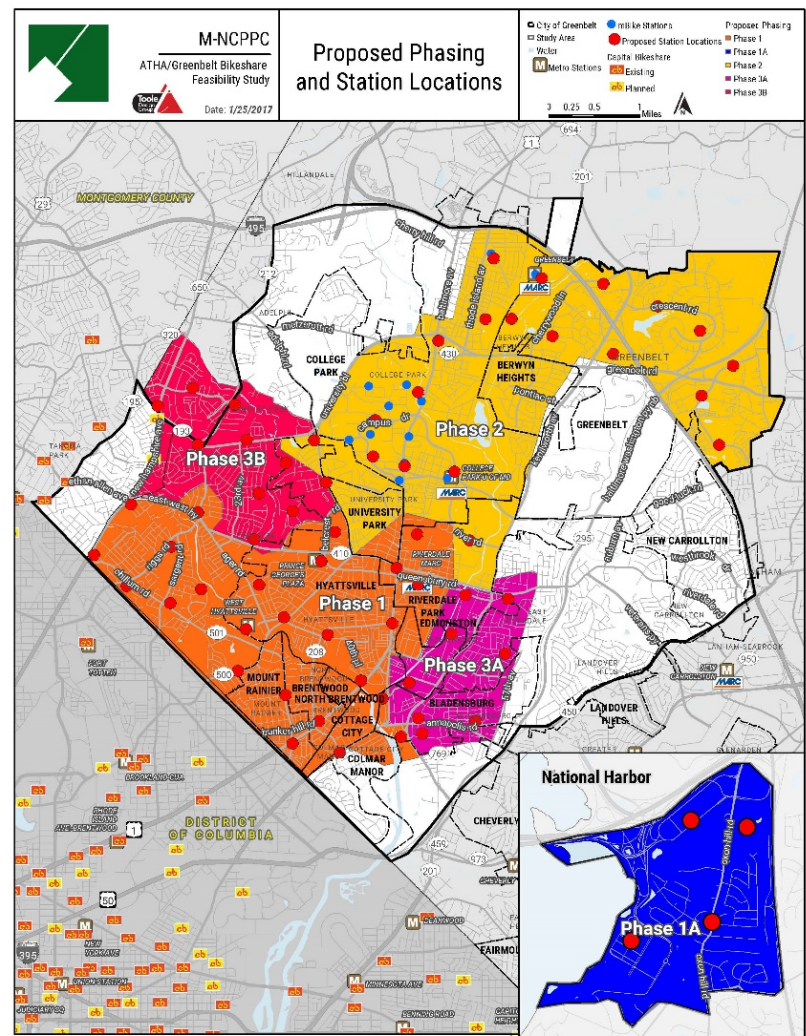
- Artway South – Chillum Road/34th Street
- Artway Central – Northwest Branch Stream Valley Park Trail
- Artway North – Hamilton Street/Gallatin Street

## 8. ATHA Bikeshare Study

This study, completed by MNCPPC-PG in 2016 considered the feasibility of implementing a bike share program in the Anacostia Trails Heritage Area and National Harbor areas of Prince George's County. Based on the analysis of existing conditions, feedback received from stakeholder input, and, conversations with county officials and agencies, expansion of the existing Capital Bikeshare program (currently in the District of Columbia and Montgomery County) was recommended. The recommended phasing and generalized station locations can be found in the figure on the right.

The report recommended the implementation of eight bike share stations within the city limits as part of Phase I rollout. These locations include:

**Figure 4: Proposed Phasing and Bikeshare Station Locations**



- West Hyattsville Metro
- Ager / Nicholson
- Jefferson / Baltimore
- Queens Chapel / Hamilton
- PG Plaza Metro
- University Town Center
- Hamilton / 38th
- Melrose Skatepark

## **9. Hyattsville Elementary School Safe Route to School Plan**

The 2011 Hyattsville Elementary School Safe Route to School Plan, completed by Sabra, Wang & Associates, Inc., identifies ways to improve safety and accessibility for pedestrians and bicyclists during arrival and dismissal. The document includes an evaluation of existing conditions near the school and observations, as well as an overview of the current road network, traffic operations, pedestrian and bicycle facilities, and problematic intersections. Surveys were conducted to assess walking and bicycling behaviors. The plan contains recommendations for Safe Routes to School projects, short- and long-term engineering, and strategies for school zone operation improvements.

Specific standards included:

- The Maryland Safe Routes to School Handbook recommends a walking radius of 1-2 miles from the school site location.
- Any students volunteering for crossing guard positions should be given an advanced education course using the Maryland Safe Routes to School brochure from Maryland Highway Safety Office.

Specific recommendations included:

- Installing stop sign controls, crosswalks, ramps, and stop bars along Jefferson Street at both the east and west legs of 43<sup>rd</sup> avenue
- Installing reduced speed (20 mph) signs along Jefferson Street and 43<sup>rd</sup> Avenue
- Focusing on making improvements along key walking routes including 42<sup>nd</sup> Avenue, Longfellow Street, Jefferson Street, Gallatin Street, and 38<sup>th</sup> Street.

### 3. Data Collection and Assessment

To develop an understanding of existing conditions throughout the City, various data collection related tasks were executed. This section provides a summary of each data collection task.

#### Collection of GIS data from the City

Following the project kickoff meeting in June 2017, Study Team requested Geographic Information System (GIS) layers from the City to help with the construction of base maps, traffic and transportation analyses. The City also shared their branding guidelines so that all project materials conform to Hyattsville's standards. Table 1 shows a list of requested data.

**Table 1: Requested Data from the City**

| Transportation                | Planning                      | Other               |
|-------------------------------|-------------------------------|---------------------|
| Road centerline               | Recent planning documents     | Vector logos        |
| AADT                          | Approved private developments | Branding guidelines |
| Functional classification     | Land use – existing / future  |                     |
| Posted speed limits           | Parcels                       |                     |
| Number of lanes               | Traffic analysis zones (TAZ)  |                     |
| Presence of on-street parking | Topographic contours          |                     |
| Pavement width                | Major transmission lines/ROW  |                     |
| Shoulder width                | Water features                |                     |
| Curb and gutter data          | City Boundaries               |                     |
| Bicycle facilities/trails     | Regional Attractions          |                     |
| Transit (bus and rail)        |                               |                     |
| Crash data                    |                               |                     |
| Traffic modeling data         |                               |                     |

In addition to the GIS data described above, cell phone data captured between the months of September 2016 and August 2017 was used to assess local and regional travel behaviors.

Additional traffic modeling, forecast, and operational modelling files were requested by the Study Team. These were derived from the Maryland Department of Transportation State Highway Administration (MDOT SHA) Travel Forecasting and Analysis Division (TFAD) data.

#### Field Assessment

Field observations with a focus on key roadways and intersections were conducted to record characteristics of the existing transportation network. The main purpose of these observations was to note operational and/or safety deficiencies, as well as to validate the models that will be used to develop recommendations on the future conditions portion of the Study.

Field observations were conducted during the period of October 7 through 16, 2017. Prior to beginning the field assessment, the Study Team worked with city staff to develop the methodology and data inputs. The methodology focused on evaluating a variety of street types and intersections, based on the existing functional classification. The Study Team collected data including photos and geocoded information so that it was easily integrated with the GIS data provided by the City.



To streamline the data collection, TDG developed an online inventory using the publicly-available Fulcrum app on a portable tablet. The table below provides a summary of the data collected:

**Table 2: Field Assessment – Proposed Data to be Collected**

| <b>Intersections (points)</b>      | <b>Corridors (lines)</b>                   |
|------------------------------------|--------------------------------------------|
| Number of curb extensions          | Posted speed                               |
| Number and condition of curb ramps | Street width                               |
| Existing traffic control device    | Traffic flow (ex. one-way, two-way, other) |
| Number and type of crosswalk       | Existence of parking lanes                 |
| Lighting type                      | Existence of traffic calming treatments    |
|                                    | Lighting type                              |
|                                    | Presence and width of sidewalks            |

Concurrent with the development of the methodology, the Study Team collaborated with City staff to prioritize corridors and intersections for field assessment. A map of prioritized corridors and intersections for field work can be found in Figure 5 below. Data was collected for 39 study intersections and over 16 miles of mostly city owned and maintained roadways. Queens Chapel Road, which is a state-owned facility, was included in the assessment due to its prominent location separating major residential neighborhoods in the City.

### Summary of Findings

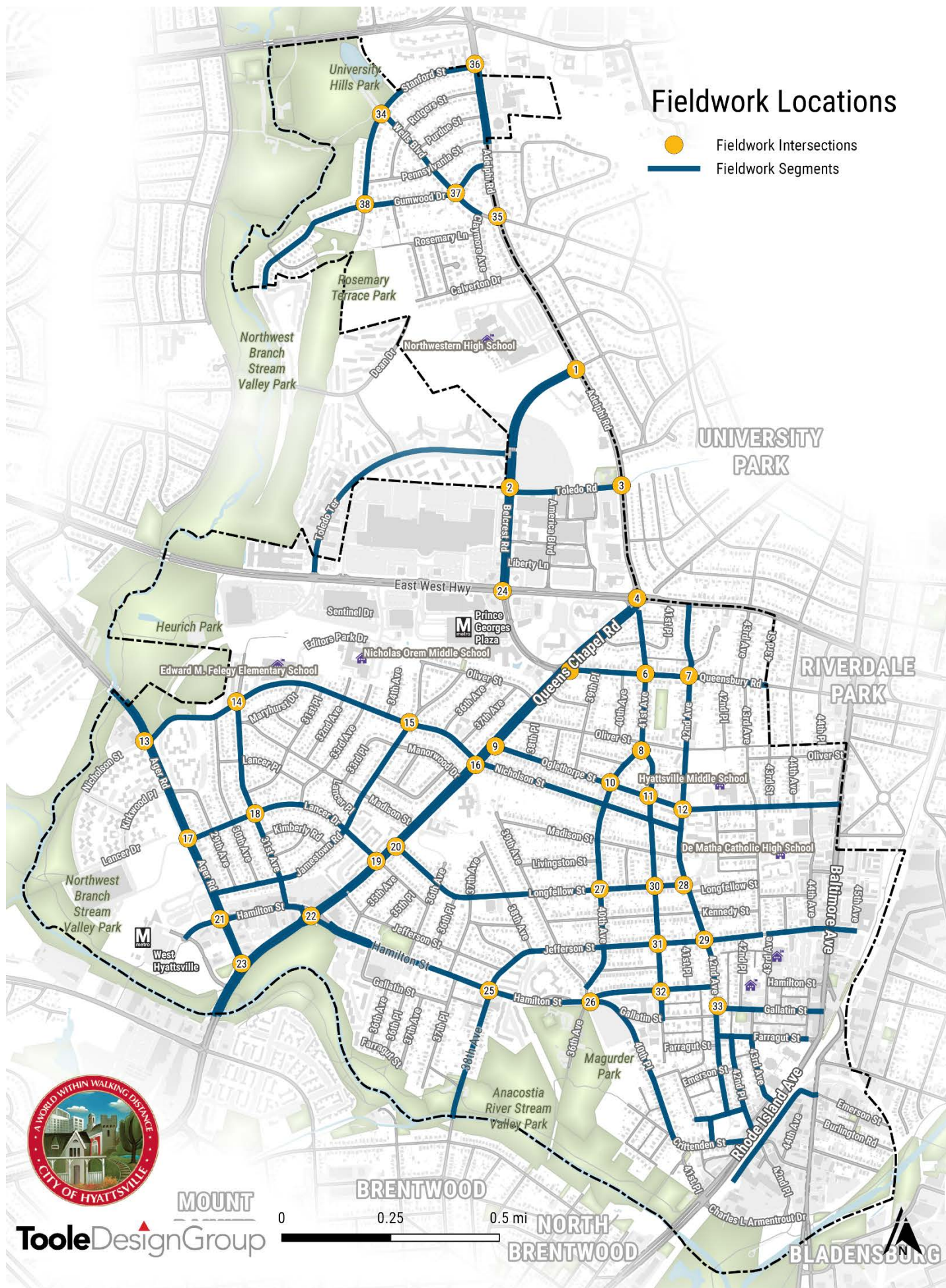
The following section describes the findings and observations from the data collection and provides thematic maps as a reference.

### Intersections Assessment – Crosswalk Type

Approximately 38 percent of the studied intersections (15 of 39) did not have any crosswalks. These intersections were:

- Adelphi Road and Stanford Street
- Stanford Street and Wells Road
- Gumwood Drive and Stanford Street
- Gumwood Drive, Wells Boulevard, Wells Parkway and Notre Dame Street
- Oglethorpe and 41st Avenue
- 41st Avenue and Longfellow Street
- 40th Avenue and Longfellow Street
- 41st Avenue and Jefferson Street
- 42nd Avenue and Longfellow Street
- Queens Chapel Road and Oglethorpe Street
- Queens Chapel Road and Nicholson Street
- Queens Chapel Road and Longfellow Street
- Queens chapel Road and Lancer Drive
- Lancer Drive and 31st Avenue
- Lancer Drive and Ager Road

Figure 5: Proposed Fieldwork Locations





Most of the intersections that did not have crosswalks are located along local streets. These include 41<sup>st</sup> Avenue, 42<sup>nd</sup> Avenue, and Lancer Drive among others.

High-visibility crosswalks are present in 36 percent (14 of 39) of all intersections studied. Most high visibility crosswalks are in good condition and comply with Manual on Uniform Traffic Control Devices (MUTCD) standards. However, some crosswalks particularly on major roadways including Queens Chapel Road are faded, presenting potential safety issues.

About one-quarter (10 of 39) of all intersections studied include continental (double parallel lines) crosswalks. Figure 7 illustrates crosswalk inventory findings.

#### Intersections Assessment – Traffic Control Devices

As part of the intersection assessment, the Study Team documented the type of existing traffic control device. As noted in Figure 8 below, 28 percent (11 of 39) of intersections assessed included traffic signals, 44 percent (17 of 39) included four-way stops; 20 percent (8 of 39) were controlled using two-way stops; and only the intersection of Hamilton and 42<sup>nd</sup> Avenue which does not require a traffic control device because of its traffic patterns (i.e., one way), did not have one.

Intersections with traffic signal controls are concentrated along Adelphi Road, Queens Chapel Road, Ager Road, and Belcrest Road while the majority of four-way stop controlled intersections were found along 40<sup>th</sup> Avenue, 41<sup>st</sup> Avenue, and 42<sup>nd</sup> Avenue. At the time field observations were conducted, Queens Chapel Road was under construction. However, it should be noted that only the only signalized crossings of Queens Chapel Road are at Hamilton Street and Belcrest Road-Queensbury Road. These crossings are located at 0.8 miles apart. The operational analysis of the intersections is presented in Section 6.

**Figure 6: Existing High Visibility Crosswalk on Intersection of Oglethorpe Street and 42<sup>nd</sup> Avenue**





Figure 7: Intersections Assessment – Existing Crosswalk Type

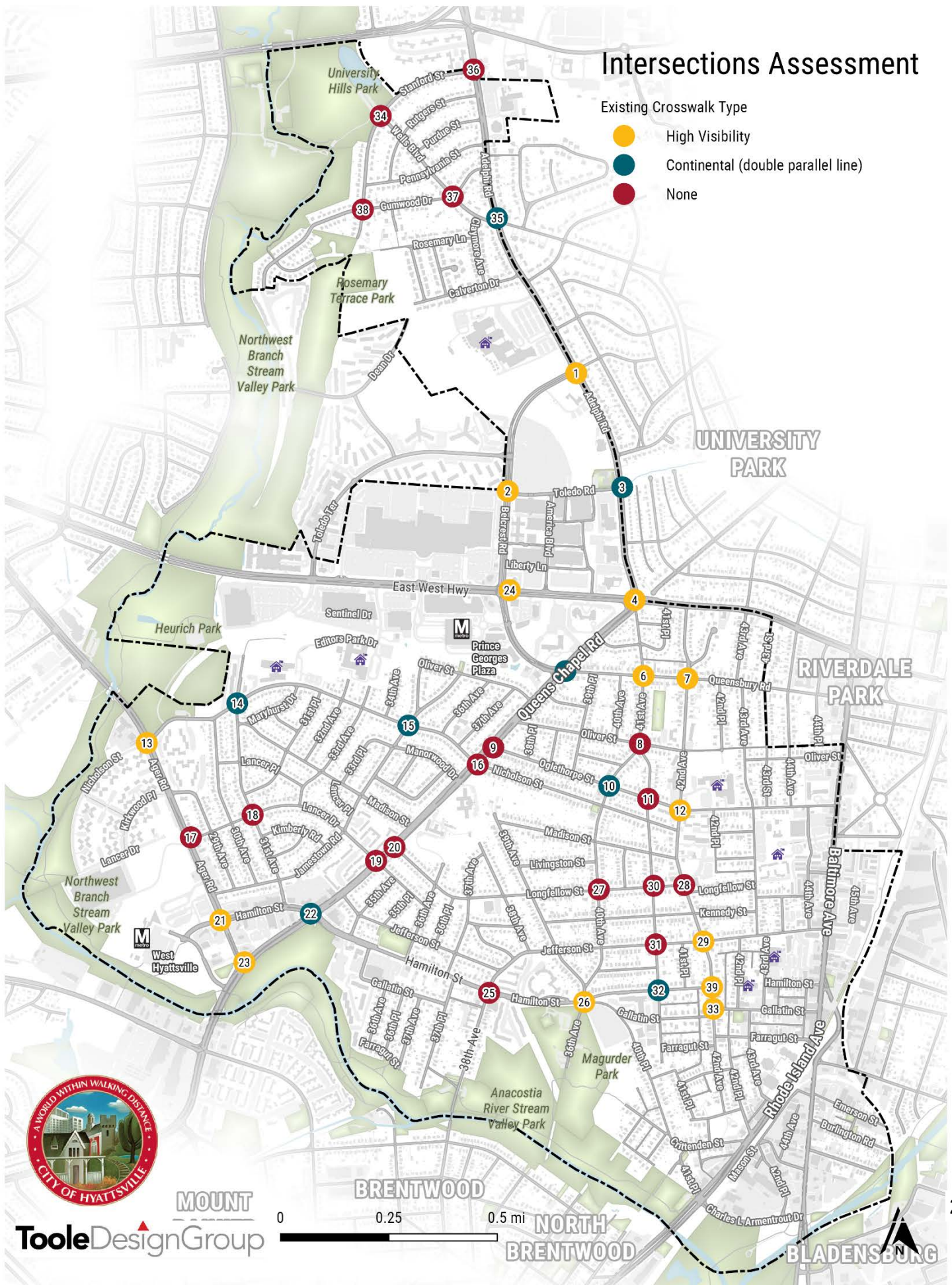
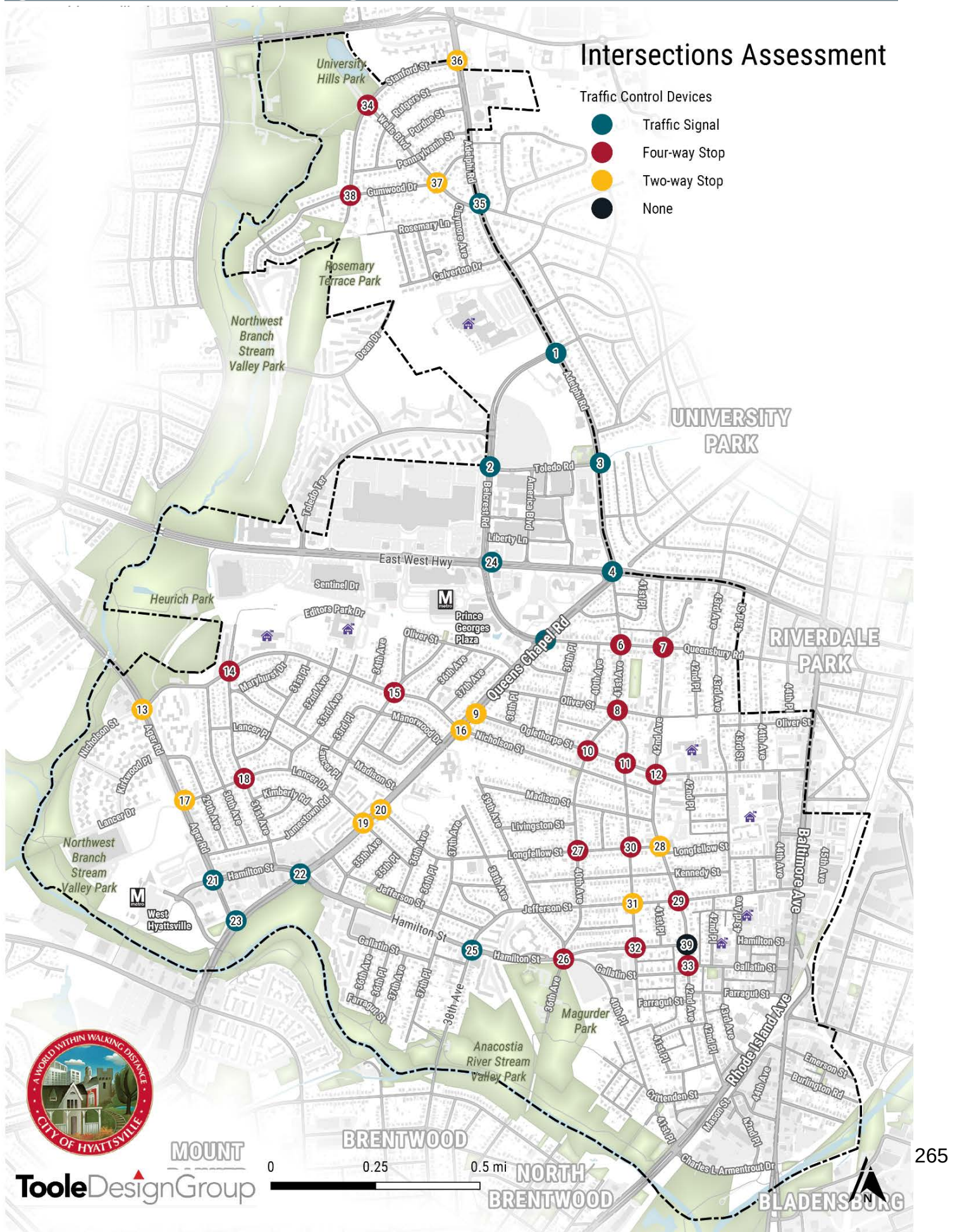




Figure 8: Intersections Assessment - Existing Traffic Control Devices



### Segments Assessment – Infrastructure Inventory

During the field assessment, Study Team took inventory of the selected roadway segments. Table 3 provides inventory of the segments. Figure 9 and Figure 10 denote the existing functional classification and right-of-way (ROW) ownership of the study segments. The traffic operation and circulation on these roadways and study intersections is further described in Section 4 of this memorandum.

**Table 3: Fieldwork Segment Characteristics**

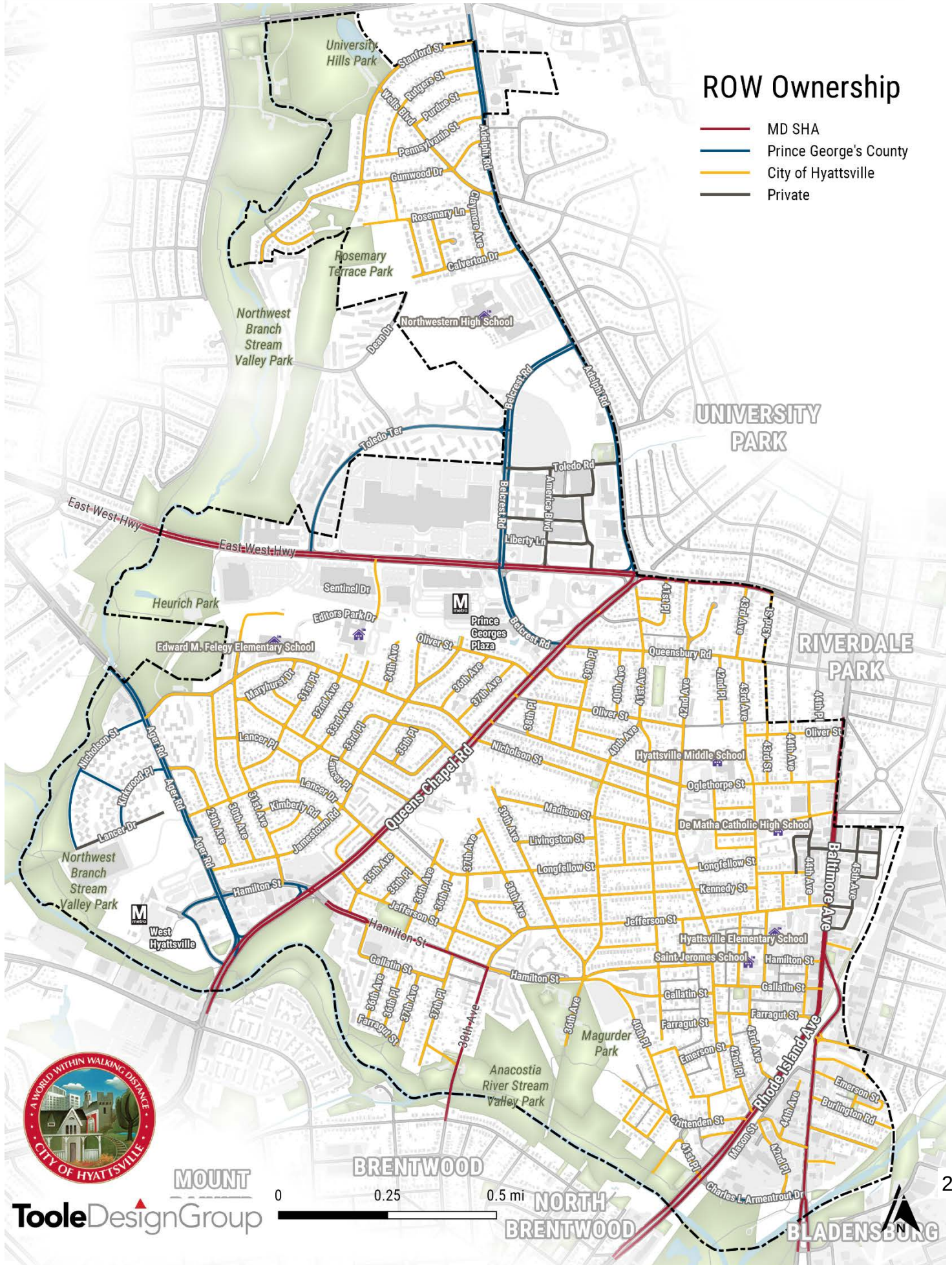
| Roadway          | Functional Classification | Ownership | Travel lanes | Posted Speed | Bike Facility       | Sidewalk | Existing Parking |
|------------------|---------------------------|-----------|--------------|--------------|---------------------|----------|------------------|
| 31ST AVE         | Local                     | City      | 2            | 25           | None                | Yes      | No               |
| 38TH AVE         | Collector                 | City      | 2            | 25           | None                | Partial  | Partial          |
| 40TH AVE         | Local                     | City      | 2            | 25           | Sharrow             | Yes      | Partial          |
| 41ST AVE         | Local                     | City      | 2            | 25           | None                | Partial  | No               |
| 42ND AVE         | Local                     | City      | 2            | 25           | None                | Yes      | Partial          |
| 42ND PL          | Local                     | City      | 2            | 25           | None                | Yes      | Partial          |
| 43RD AVE         | Local                     | City      | 2            | 25           | None                | Yes      | Partial          |
| ADELPHI RD       | Local                     | County    | 2            | 25           | Sharrow             | Yes      | Yes              |
| AGER RD          | Local                     | County    | 4            | 25           | None                | Partial  | No               |
| BELCREST RD      | Local                     | County    | 4            | 25           | None                | Yes      | No               |
| CRITTENDEN ST    | Local                     | City      | 2            | 25           | None                | Yes      | No               |
| DECATUR ST       | Local                     | City      | 2            | 25           | None                | Partial  | Partial          |
| FARRAGUT ST      | Local                     | City      | 2            | 25           | Sharrow             | Yes      | Partial          |
| GALLATIN ST      | Local                     | City      | 2            | 25           | Sharrow             | Yes      | No               |
| GUMWOOD DR       | Local                     | City      | 2            | 25           | None                | Partial  | Yes              |
| HAMILTON ST      | Collector                 | City      | 4            | 35           | None                | Yes      | No               |
| HAMILTON ST      | Local                     | City      | 4            | 25           | Bike Lane (Partial) | Yes      | Yes              |
| JAMESTOWN RD     | Local                     | City      | 2            | 25           | None                | Yes      | Yes              |
| JEFFERSON ST     | Local                     | City      | 2            | 25           | None                | Yes      | No               |
| LANCER DR        | Local                     | City      | 2            | 25           | None                | Yes      | No               |
| LONGFELLOW ST    | Local                     | City      | 2            | 25           | None                | Yes      | Partial          |
| NICHOLSON ST     | Local                     | City      | 2            | 25           | Sharrow             | Yes      | Partial          |
| NICHOLSON ST     | Local                     | City      | 2            | 25           | Sharrow             | Yes      | Yes              |
| NOTRE DAME ST    | Local                     | City      | 2            | 25           | None                | Partial  | Yes              |
| OGLETHORPE ST    | Local                     | City      | 2            | 25           | None                | Yes      | No               |
| QUEENS CHAPEL RD | Arterial                  | SHA       | 4            | 35           | Sharrow             | Yes      | No               |
| QUEENSBURY RD    | Local                     | City      | 2            | 25           | None                | Partial  | No               |
| STANFORD ST      | Local                     | City      | 2            | 25           | None                | Partial  | Yes              |
| TOLEDO RD        | Local                     | City      | 2            | 25           | None                | No       | No               |
| TOLEDO TER       | Local                     | County    | 2            | 25           | None                | Partial  | No               |
| WELLS BLVD       | Local                     | City      | 2            | 25           | None                | No       | Yes              |







Figure 10: Right of Way Ownership





### Segment Assessment - Pedestrian Conditions

The City of Hyattsville has a comprehensive network of sidewalks illustrated in Figure 12. Areas without sidewalk coverage tend to be residential neighborhoods, and while sidewalk coverage is fairly comprehensive throughout the city, some sidewalks have temporary or permanent obstructions that impede pedestrians such as trash cans, utility poles, or other obstacles (see Figure 11).

Throughout the City, there is significant variability in the presence and quality of other pedestrian facilities such as curb ramps, crosswalks, pedestrian signals, accessible bus stops, wayfinding, and regulatory signage. At various intersections, faded crosswalks were noted, particularly across wider roadways. There are also areas of the City where substandard or missing curb ramps create barriers for people with disabilities and people pushing strollers, particularly across or along larger roadways such as Queens Chapel Road, Ager Road, and Baltimore Avenue (Route 1). Similarly, while some traffic signals provide pedestrian countdown signals, many of these feature an older type of signal without a countdown, or none at all.

**Figure 11: Existing Sidewalk Obstruction on Local Street**



Segments shown in red in Figure 13 represent road segments with no sidewalks and/or segments where the sidewalk width is less than 4 ft. (the minimum allowed width under ADA standards). Of the over 16 miles of roadway assessed, 10 percent did not have any sidewalk. These were:

- Wells Boulevard and Wells Parkway, from Stanford Street to Adelphi Road.
- Gumwood Drive, from Stanford Street to Wells Boulevard
- Notre Dame Street, from Wells Boulevard to Adelphi Road
- 41<sup>st</sup> Avenue, from Oglethorpe Street to Nicholson Street
- 41<sup>st</sup> Avenue, from Longfellow Street to Kennedy Street
- 41<sup>st</sup> Avenue, from Ingraham Street to Farragut Street
- Decatur Street, from 42<sup>nd</sup> Place to 41<sup>st</sup> Place
- 42<sup>nd</sup> Avenue, from Decatur Street to Crittenden Street
- Rhode Island Avenue, from Baltimore Avenue (Route 1) to 42<sup>nd</sup> Place.

Sidewalk gaps along Queens Chapel Road and Ager Road contribute to particularly problematic pedestrian conditions due to do the free right turn from Ager to Queens Chapel Road. Sidewalk gaps on the historic neighborhood are concentrated along 38<sup>th</sup> Avenue, 41<sup>st</sup> Avenue, and 42<sup>nd</sup> Avenue.

**Sidewalk Coverage**

- Existing Sidewalk
- Water
- Park

Northwest Branch Stream Valley Park

University Hills Park

Adelphi Rd

Rosemary Ln

Pennington St

Northwest Branch Stream Valley Park

Rosemary Terrace Park

Northwestern High School

UNIVERSITY PARK

Belcrest Rd

Toledo Ter

East West Hwy

Belcrest Center Dr

0.25

0.5 mi

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### Figure 13 B: Sidewalk Coverage

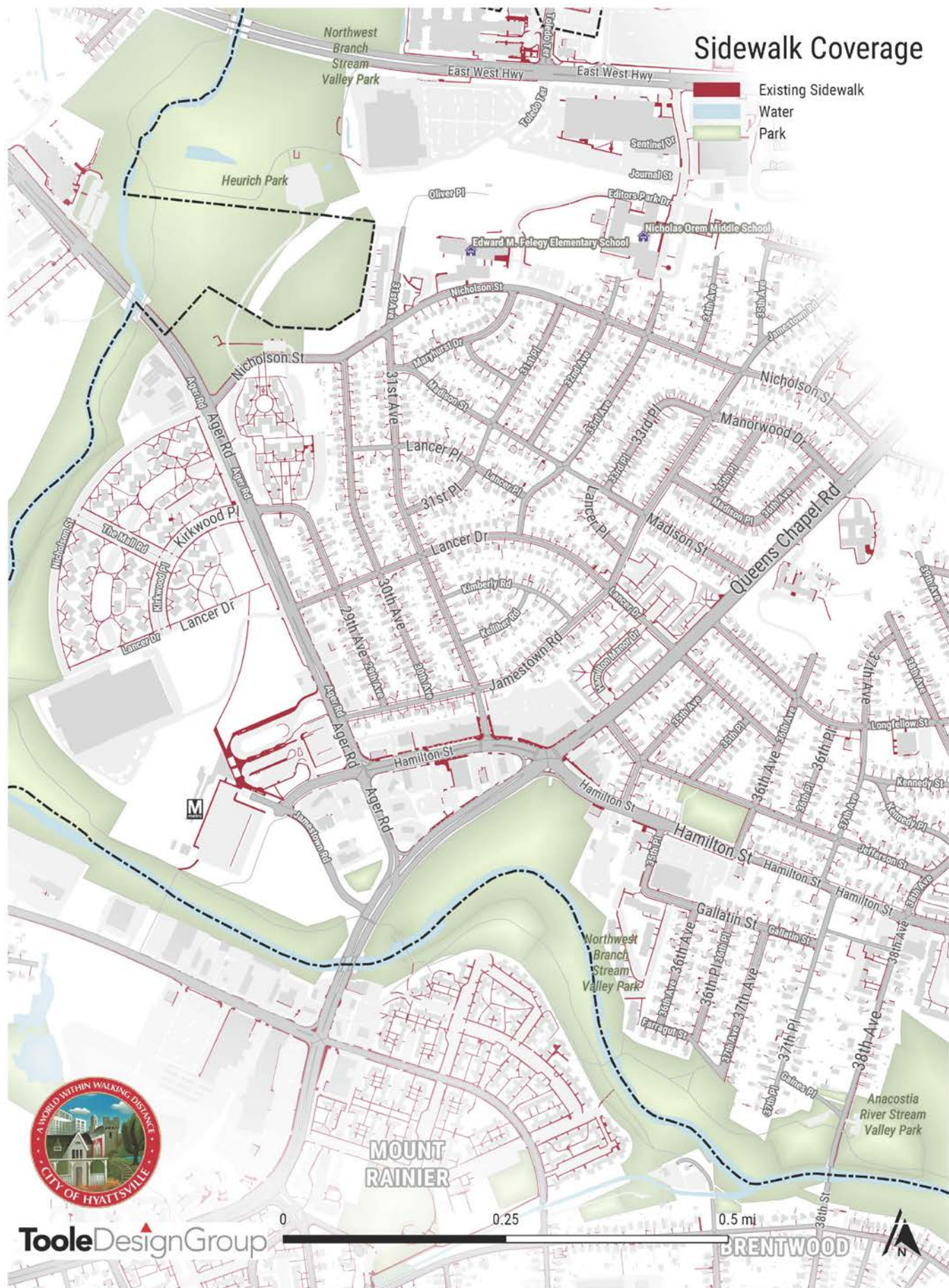




Figure 14 C: Sidewalk Coverage

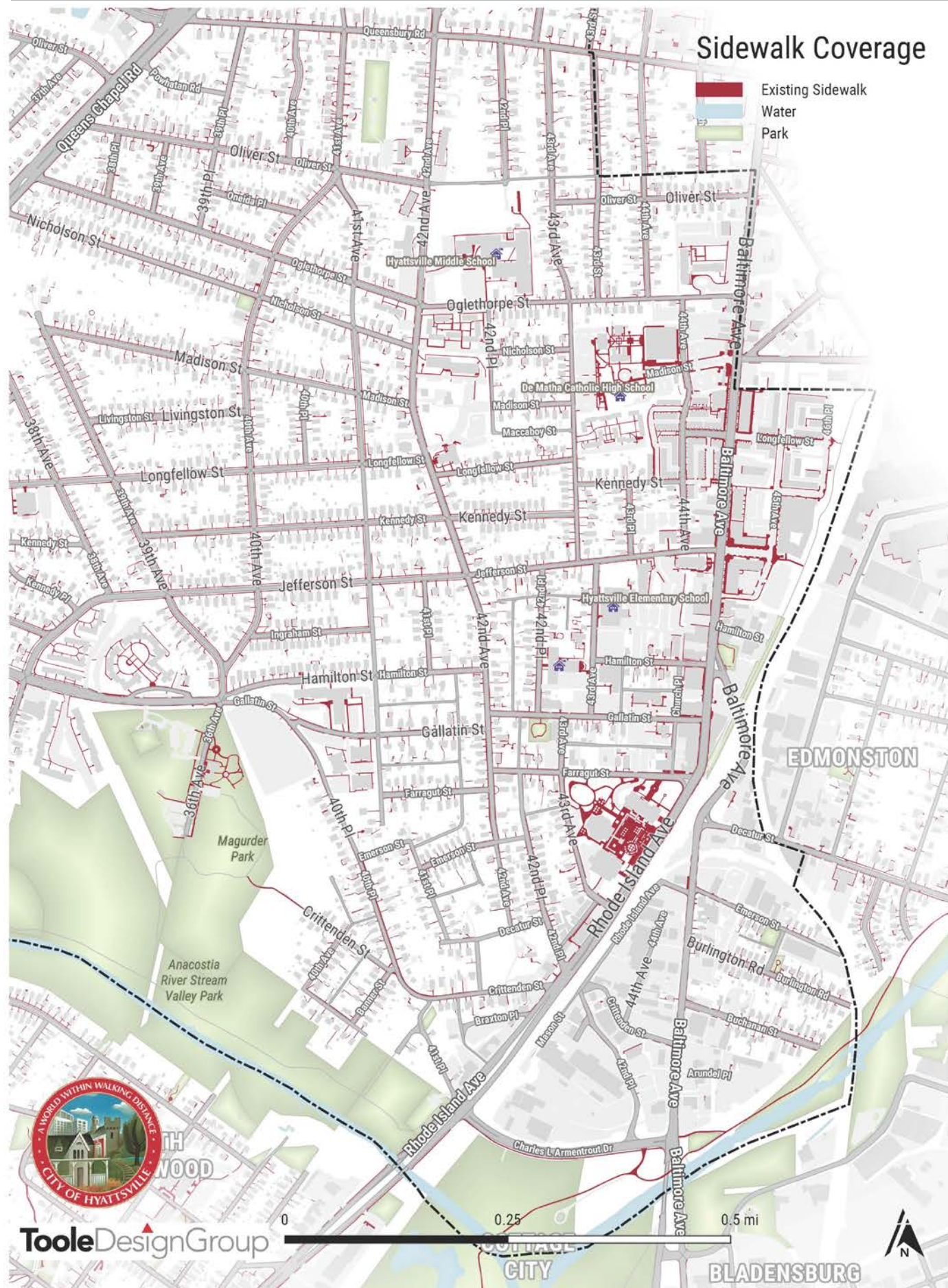
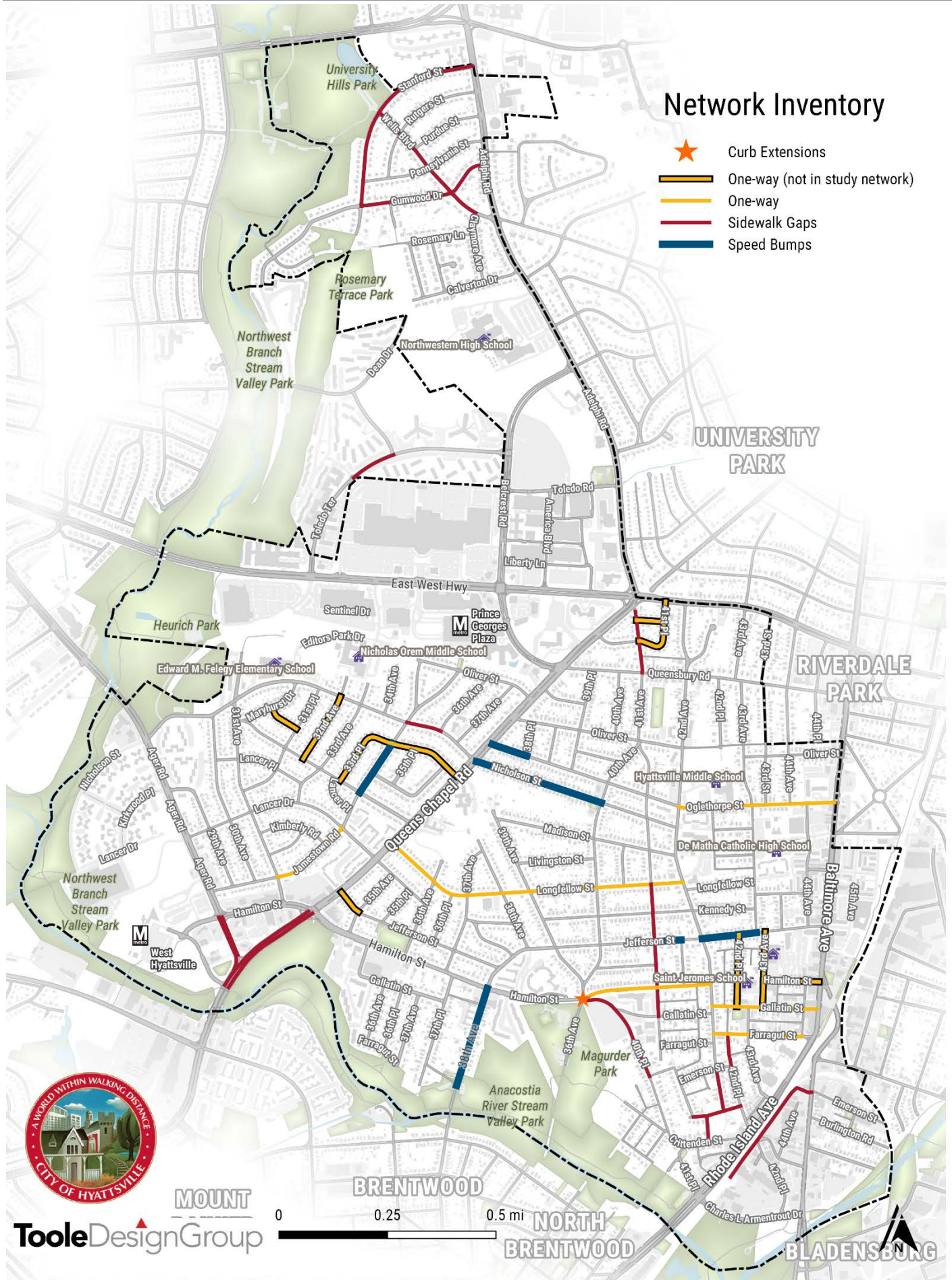




Figure 15: Segment Assessments





Field surveyors also noted that while Baltimore Avenue (Route 1) was not part of the field study network, various sidewalks were adjacent to relatively high speed vehicular traffic (Figure 14). Additionally, inconsistent sidewalk widths, sidewalk buckling, and exposed pipes adjacent to the sidewalk made it difficult for pedestrians to travel along the corridor.

**Figure 16: Existing conditions along Baltimore Avenue (Route 1)**



**Figure 17: Missing Curb Ramps in Front of St. Jerome Academy (left); Faded Crosswalk on Adelphi Road (right)**





While a complete field review of all pedestrian facilities was outside the scope of this study, several bus stops along major corridors did not provide accessible landing pads or connections to existing sidewalks. This can make it difficult for residents and visitors with disabilities to use the existing bus service.

Uneven sidewalks and sloping driveways were also found. These represent additional impediments for pedestrians with disabilities and parents using strollers along sidewalks. Finally, in some areas that experience higher pedestrian volumes (ex. close to elementary and middle schools), existing sidewalk widths were found to be ADA compliant (i.e., more than 4 ft. wide), do not comfortably accommodate bi-directional pedestrian traffic or two strollers walking side by side as noted in the figure below.

**Figure 18: Uneven Sidewalk (left) and sloping driveways create access management issues on sidewalks (right)**



**Figure 19: Existing Sidewalk is too Narrow to Accommodate side-by-side stroller traffic.**





### Segment Assessment - Bicycle Infrastructure:

The overall conditions of existing bicycle infrastructure throughout the City of Hyattsville is in fairly good condition. The existing bicycle network in the city consists of on-street facilities mostly in the form of shared-lane markings or sharrows, and off-street trails, with both the Northeast and Northwest Branch trails bordering the city. Table 4 and Figure 19 provide a summary of existing and planned bicycle infrastructure in Hyattsville.

**Table 4: Existing Bicycle Facilities (miles)**

| Type of Facility | Miles        |
|------------------|--------------|
| Bike Lane        | 0.22         |
| Trail            | 24.49        |
| Shared Roadway   | 6.44         |
| <b>Total</b>     | <b>31.15</b> |

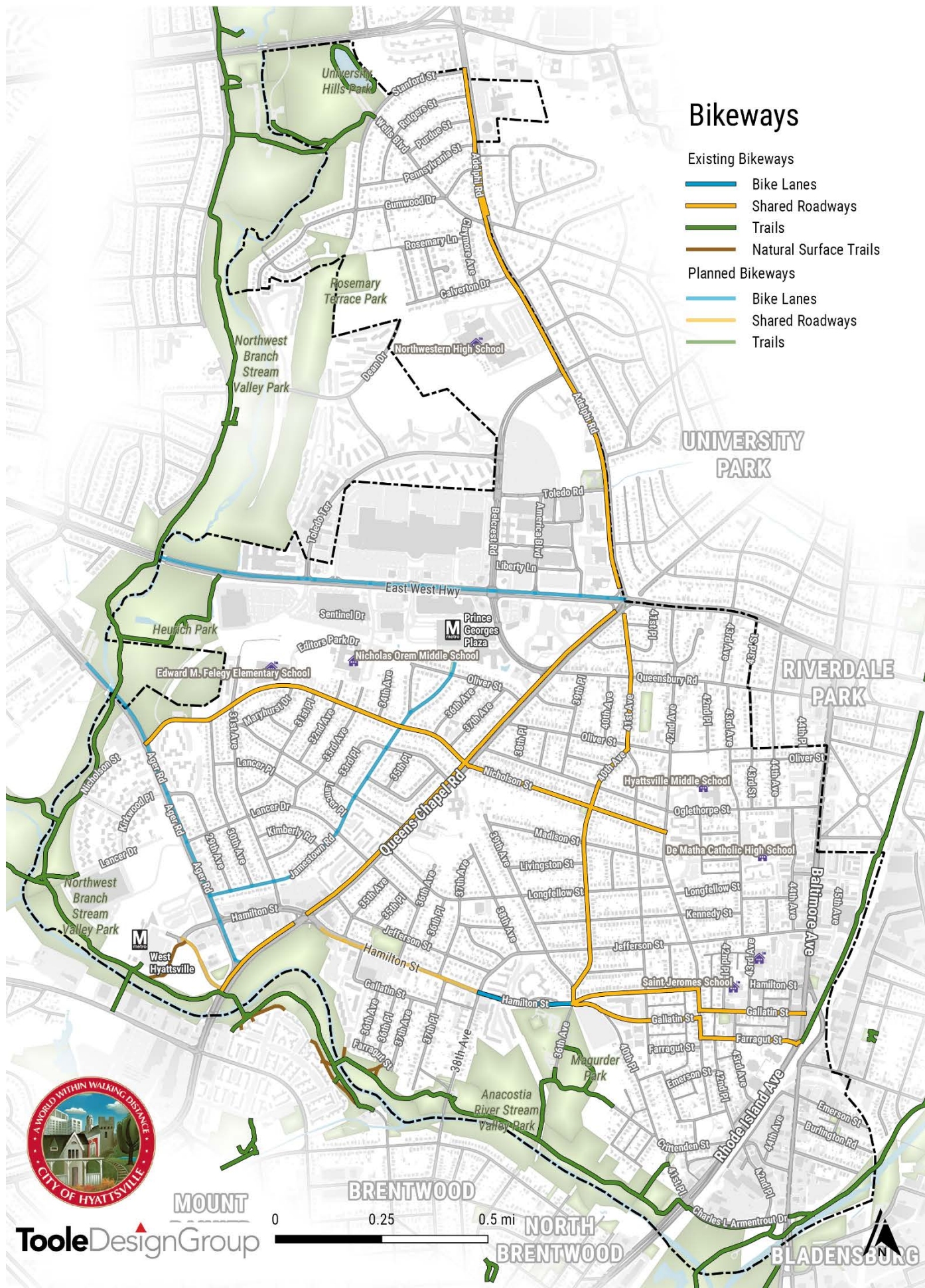
A network of sharrows, as shown in Figure 18, and wayfinding currently exists on Hamilton Street, Nicholson Street, 40th Avenue, and Gallatin Street. The existing narrow streets in addition to existing 25 mph posted speed limits in most local streets, make it relatively easy for residents and visitors to traverse the City. However, existing one-way street configurations on Longfellow Street, Oglethorpe Street, Hamilton Street, Gallatin Street, and Farragut Street make circulation cumbersome and circuitous for bicyclists, especially throughout Downtown Hyattsville. Further, one-way circulation in some of these corridors provides overly-wide travelways to motorists which may encourage drivers to speed, reducing safety and comfort for people walking and bicycling.

**Figure 20: Existing Wayfinding does not comply with current MUTCD Standards**





Figure 21: Bikeways



### Wayfinding

Existing wayfinding signs are generally in good condition and are concentrated along existing bicycle and pedestrian routes. Figure 21 presents the types and conditions of existing wayfinding signs assessed. Many of the signs found throughout the study area, however, do not comply with MUTCD size, color or font standards, and does not have a consistent design that showcases the City's unique character and branding. The Study Team also found that existing signage was not always located in visible places (ex. at 42<sup>nd</sup> Avenue and Hamilton) and was sometimes difficult to read. Further, while some destinations/routes designated as preferred routes, such as Adelphi Road, are the most direct routes for people walking and biking, they may not provide the most comfortable walking and biking environments. A separate wayfinding report being prepared as part of this study, will provide additional details on existing condition of the signs and recommendations for new design, location and directions.

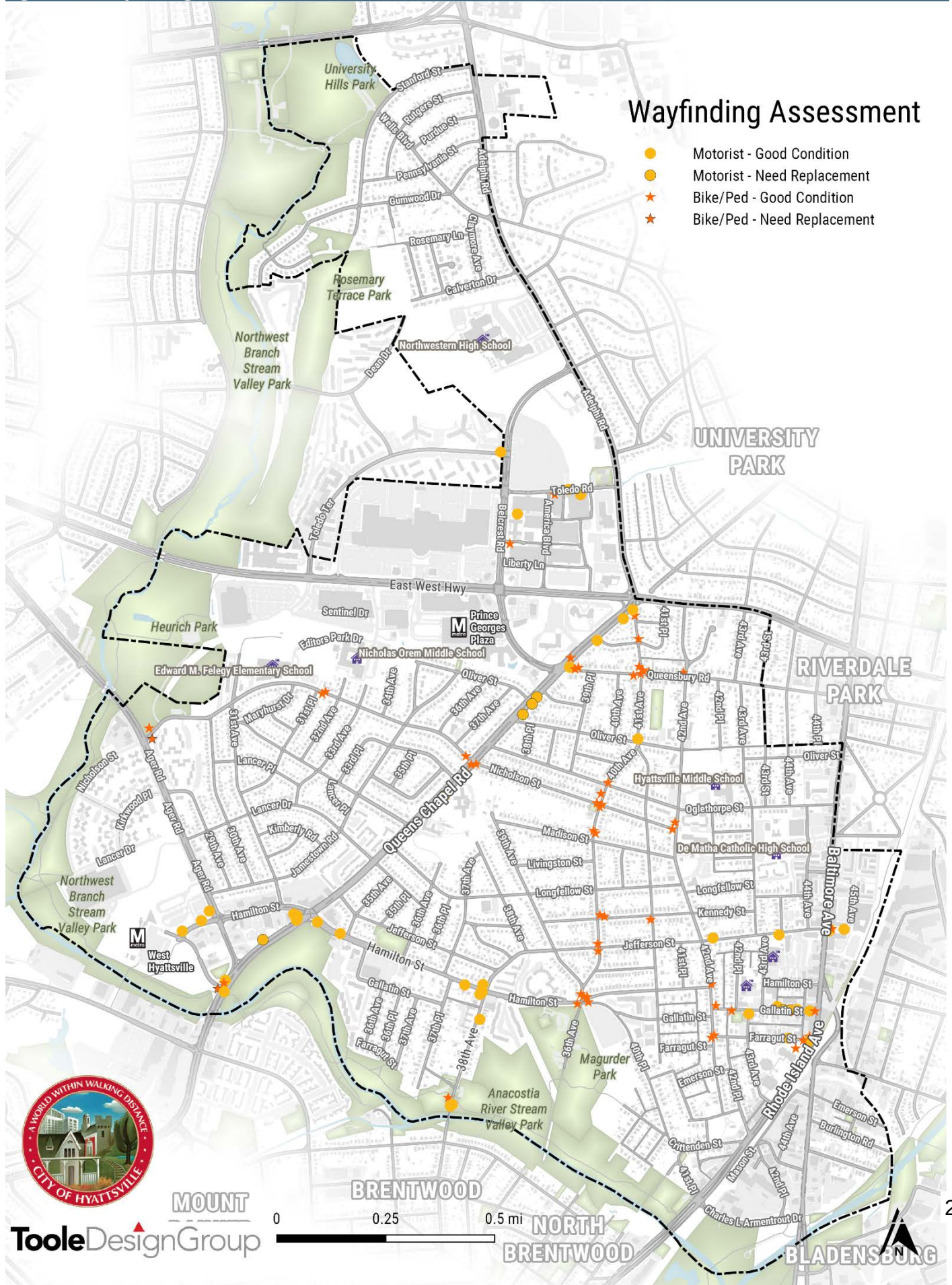
Figure 22: Disjointed Wayfinding in Study Area



Field surveyors did note signs that should be replaced due to poor condition. These are indicated on the map on Figure 21 in red triangles and circles.



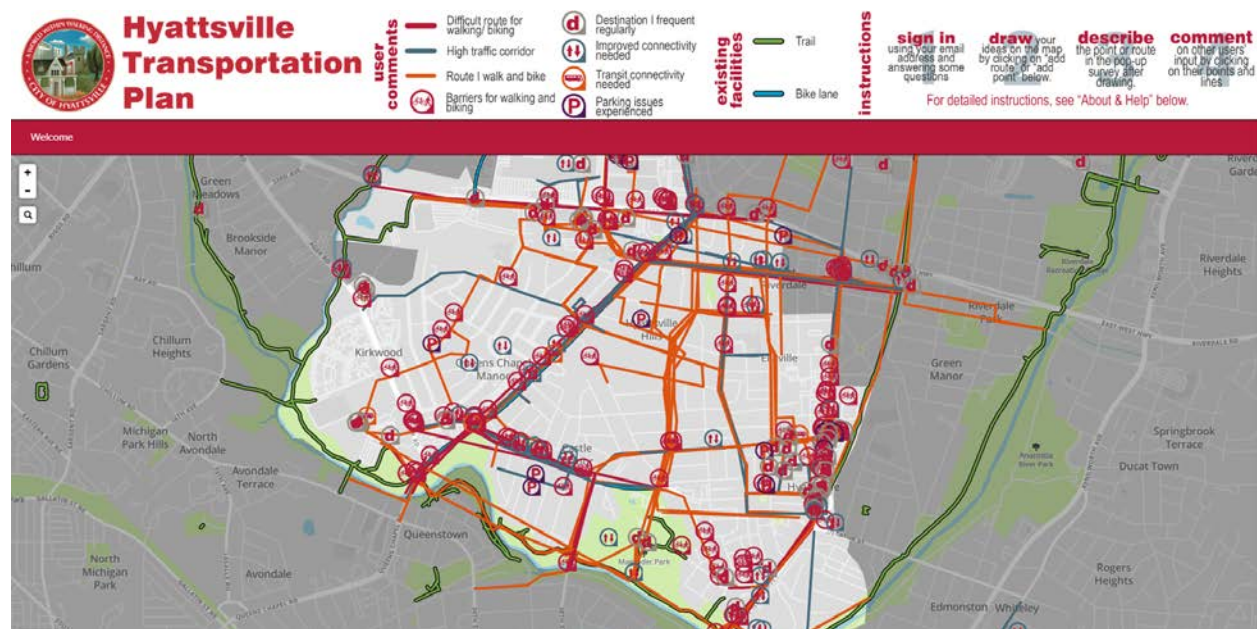
Figure 23: Wayfinding Assessment



## 4. Wikimap Summary

To complement existing public engagement and gather additional input from the community about specific issues throughout city streets, the Study Team developed two online interactive crowdsourcing maps, or wikimaps. The maps, one in English and one in Spanish, allowed residents to identify barriers and difficult routes for walking and biking as well as provide information about preferred routes, issues with parking and connectivity. The wikimaps were active between July and November 2017. During this time, the maps received 123 line and 242 point comments from 177 users across all five city wards.

Figure 24: Screenshot of Wikimap

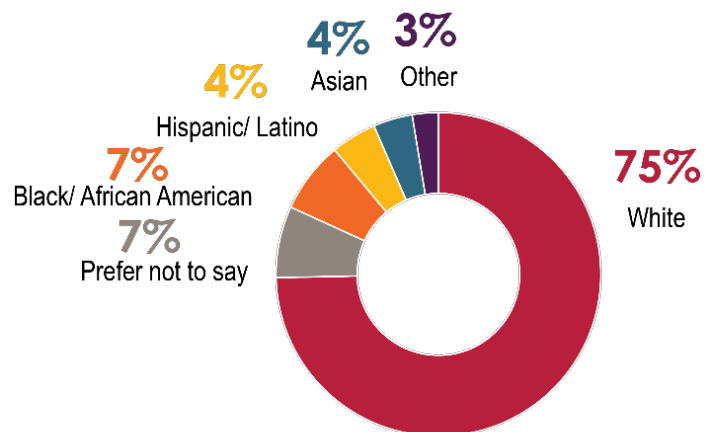


Wikimap users were also asked to complete a short survey to help the Study Team understand their background, mobility habits, and concerns. The following is a summary of demographic characteristics from wikimap respondents:

### Race and Ethnicity

Most respondents (75 percent) self-identified as white non-Hispanic, while seven percent noted they are Black/African-American and four percent noted they are Latino/Hispanic and Asian respectively.

Figure 25: Demographic Distribution of Respondents

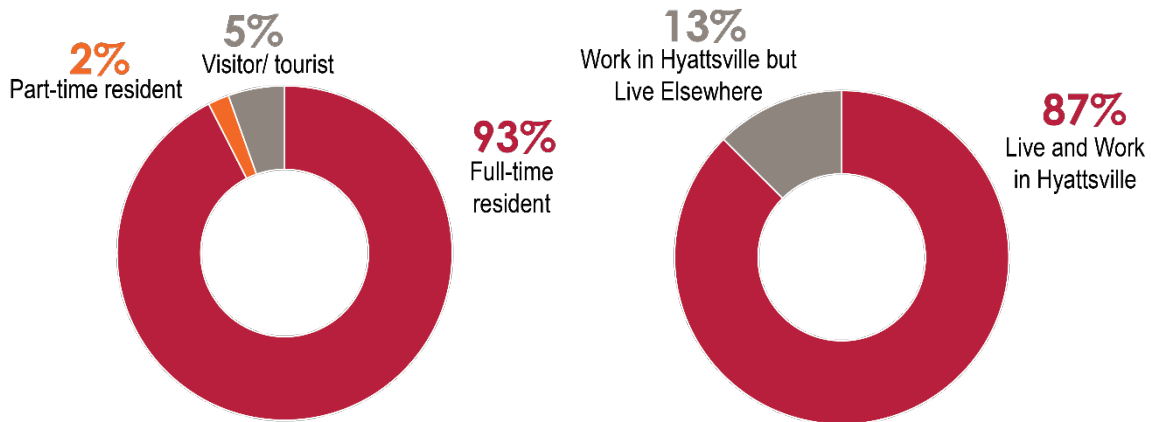




### Place of Residency and Work

As noted in the figures below, 93 percent of wikimap users reported being full-time residents of Hyattsville while five percent reported being visitor/tourists. Furthermore, 87 percent reported also working in Hyattsville. This figure is not representative of most residents of Hyattsville, according to City staff, as many work outside Hyattsville in the DC metro area.

**Figure 26: Residency and Work Status (right: residency; left: work)**

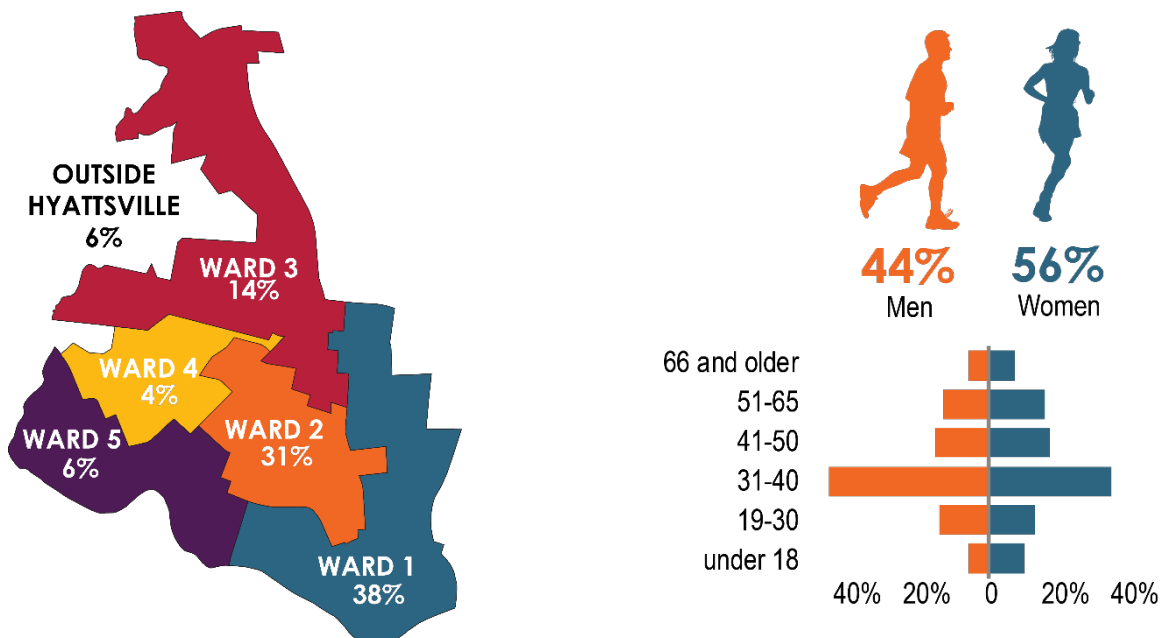


The majority of respondents (69 percent) live in Wards 1 and 2 while only around 10 percent of respondents live in Wards 4 and 5. City Staff are actively working to increase participation from these communities, however have so far been unsuccessful.

### Age and Sex

The majority of survey respondents (56 percent) self-identified as women, with a large proportion of them noted being between the ages of 31 and 40 years of age.

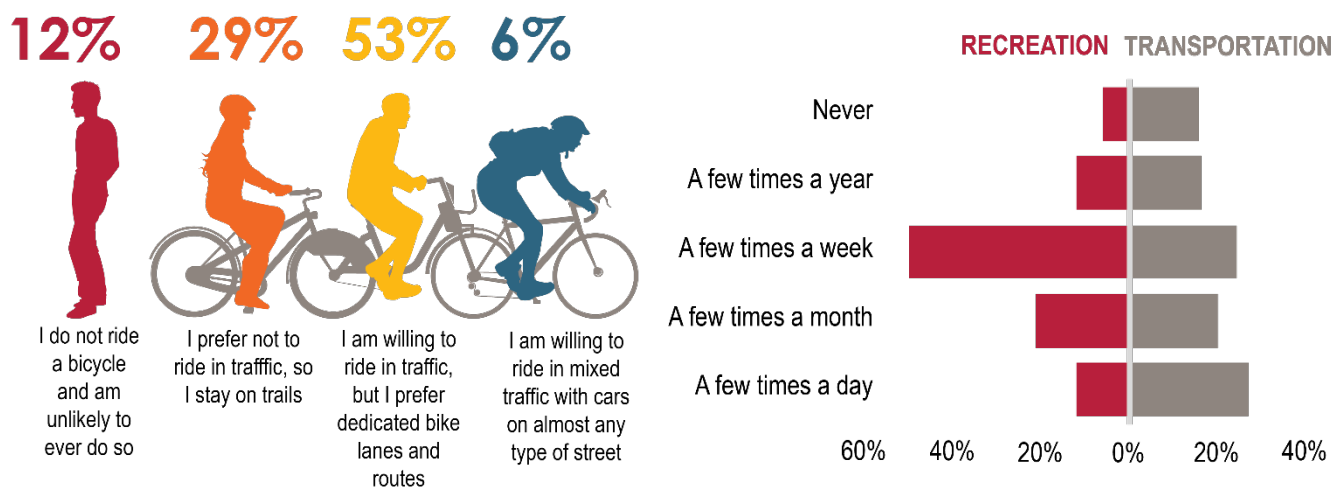
**Figure 27: Ward of Residency (Left) - Age and Sex (Right)**



## Walking and Bicycling Practices

Most users responding to the wikimap (53 percent) would like dedicated bike lanes or routes while 29 percent of residents would prefer more separation in the form of trails. Related to walking, almost 50 percent of wikimap respondents noted walking/running for recreation a few times a week, while around 25 percent of respondents reported walking a few times a day for transportation.

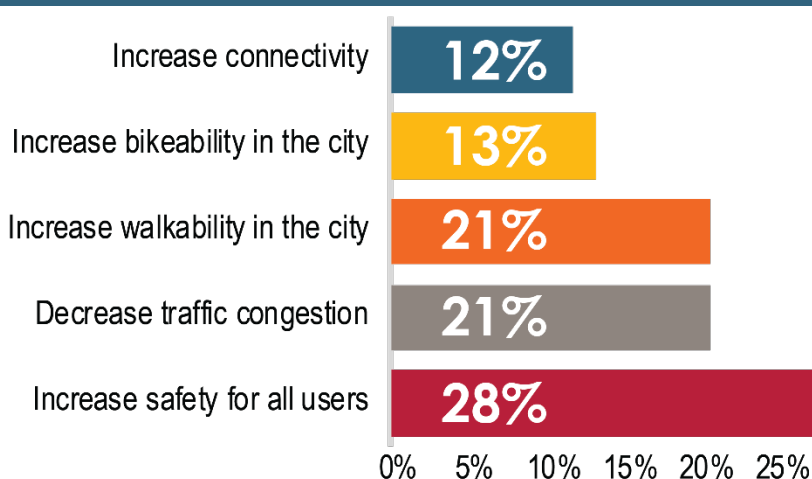
**Figure 28: Bicycling Habits (left) and Walking Habits (right)**



## Priorities for the Study

When asked to select from a set of priorities for the Transportation Study, around 34 percent of respondents noted they would like the Study's recommendation to increase conditions for bicyclists and pedestrians. More than a quarter of all respondents (28 percent) noted that they would like to see increased safety for all users as an outcome as part of the Transportation Study.

**Figure 29: Priorities for the Transportation Study**



## Issue Areas

Wikimap respondents were asked to identify corridors that represent barriers for all modes. More specifically, users were asked to use the wikimaps to note which corridors present difficulties for people walking, and where they experience high vehicular traffic.

Users were also asked to note areas where improved connectivity is needed, areas where specific barriers for walking and biking exist, areas that experience parking issues, and areas that would benefit from additional transit connectivity.



Using the data derived from the wikimaps, the Study Team developed a set of heatmaps to summarize the results. The following sections provide information about the maps. For each of the maps areas in red denote higher concentration of comments.

### **Parking and Traffic**

Wikimap respondents were asked to identify areas and corridors of the city experiencing parking issues and high traffic. Figure 28 shows the heat map of the issues. The wikimap received 31 comments related to existing traffic and 19 related to existing parking issues. The result of the analysis of data mirrors what past studies have concluded. Several corridors were identified as experiencing high traffic:

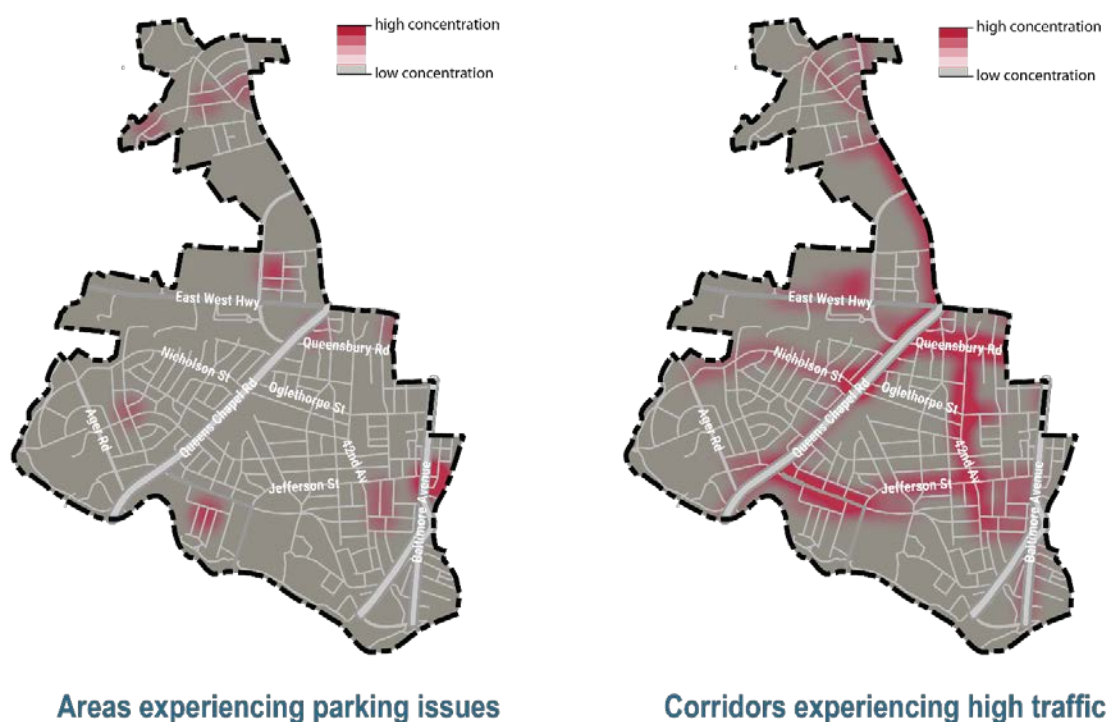
- 42<sup>nd</sup> Avenue
- Queensbury Road
- Nicholson Street
- Queens Chapel Road
- Jefferson Street
- Hamilton Street

Among the complaints about high traffic areas, many users noted that Jefferson Street and Hamilton Street experience high traffic because they are used as east-west cut-through routes by both visitors and residents. Further, Queensbury Road and Queens Chapel Road were identified as high traffic and high-speed areas that act as barriers for some people.

Areas of the city experiencing highest parking issues include:

- Downtown Hyattsville
- University Town Center

**Figure 30: Areas Experiencing Parking Issues (left) and High Traffic (right)**



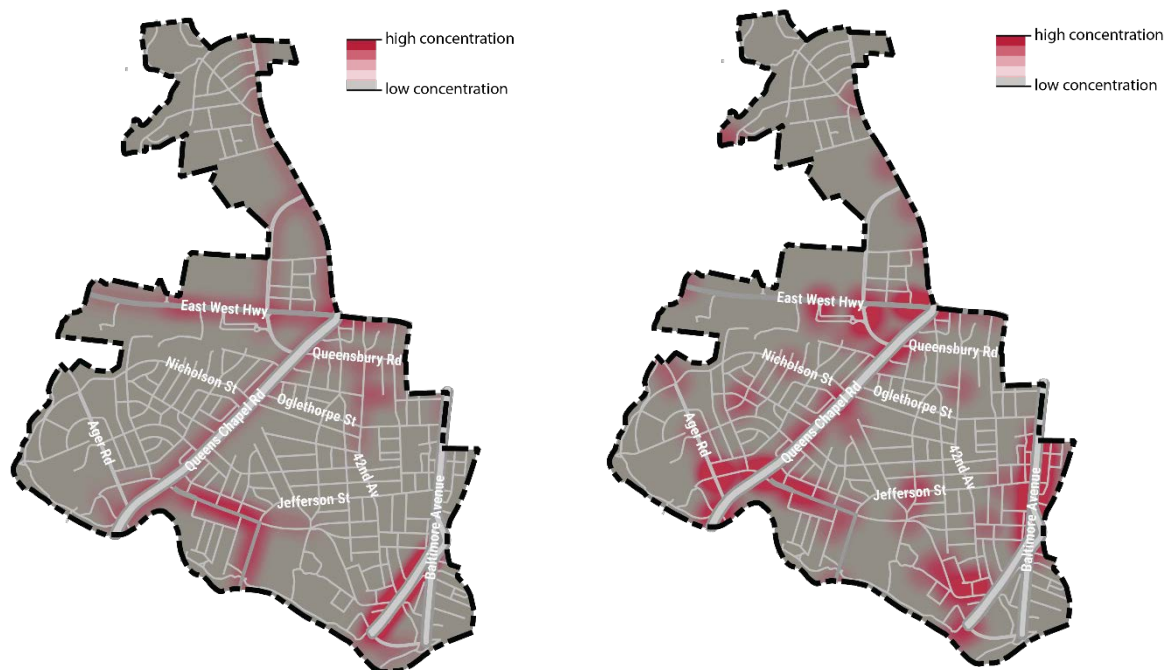
Some of the parking-related comments indicated that roads are too narrow to accommodate two-way traffic as well as parking. Other comments noted that people from other jurisdictions park their cars on local streets (where parking is free) taking away parking spaces from residents.

### *Difficult Routes and Areas for Walking and Biking*

Wikimap respondents were also asked to identify difficult routes for walking and biking. Users placed points and comments on areas/intersections that represent these barriers for biking. Figure 29 shows the heat-map of these issues. The wikimap received 202 comments related to barriers (points) and 40 related to routing (lines). The routes representing the biggest difficulty for people walking and biking include:

- East West Highway
- Queens Chapel Road
- Rhode Island Avenue (Anacostia River to Farragut Street)
- 42<sup>nd</sup> Avenue (Oglethorpe Street to East-West Highway (MD-410))
- Hamilton Street (from Queens Chapel Road to 38<sup>th</sup> Street)
- 38<sup>th</sup> Street (from the Northwest Branch Trail to Hamilton Street)

**Figure 31: Difficult Routes for Walking and Biking (left) and Barriers for Walking and Biking (right)**



**Difficult routes for walking and biking**

**Barriers for walking and biking**

Gaps in the sidewalk network, as well as (perceived) heavy and fast traffic were the most common barriers to walking and biking given by respondents. Areas identified as barriers for people biking and walking included:

- Intersection of Hamilton Street and Queens Chapel Road
- Intersection of Ager Road and Hamilton Street
- Intersection of East-West Highway and Toledo Terrace
- Intersection of Queensbury Road and Baltimore Avenue
- Intersection of Jefferson Street and Baltimore Avenue

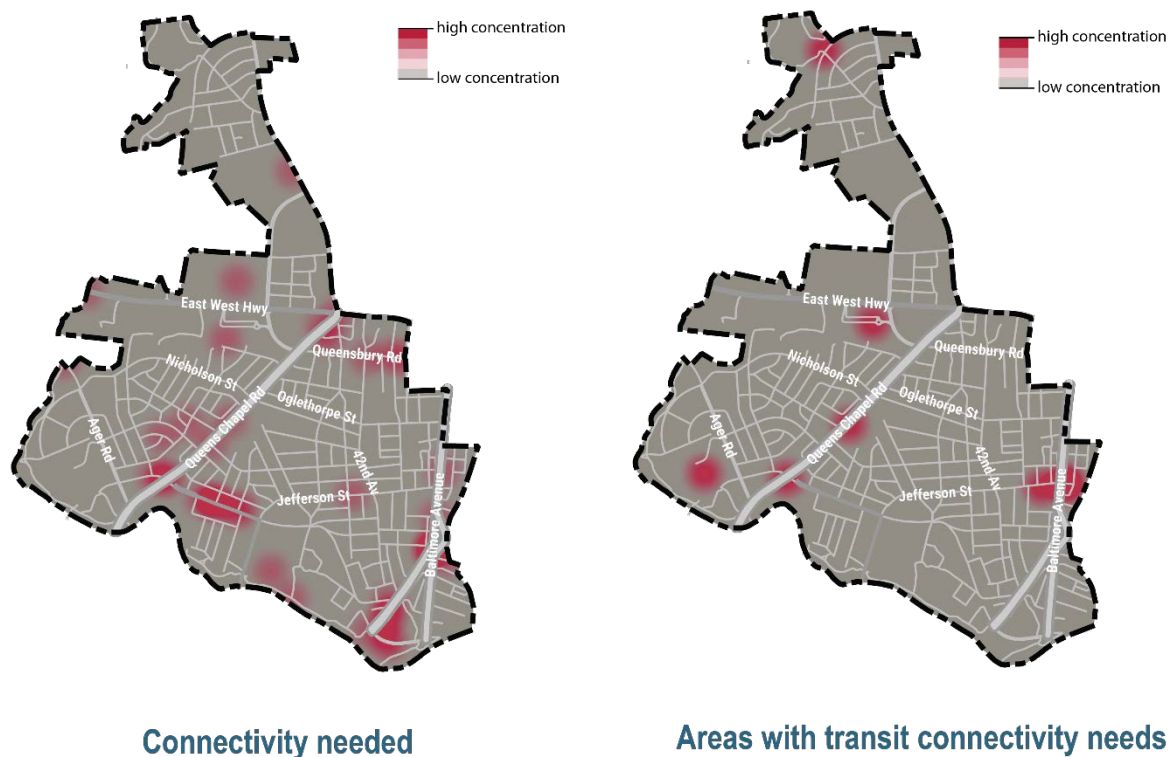
The issues that were most noted included:

- Lack of marked pedestrian crossings
- Heavy and fast traffic
- Wide street encourages motorists to speed
- Long wait at intersections
- Lack of sidewalks

### Improved Connectivity and Transit Connectivity Needs

Figure 30 below presents a heatmap of the areas in the city with connectivity needs. The wikimap received eight comments related to transit connectivity needs. Among the comments received, users noted the need for quick, frequent and reliable transit between different parts of Hyattsville and the two Metro stations. Users referenced the need for a circulator type of bus access linking the Metro stations to the Arts District.

**Figure 32: Areas Where Improved Connectivity is Needed (left); Transit Connectivity Needed (right)**

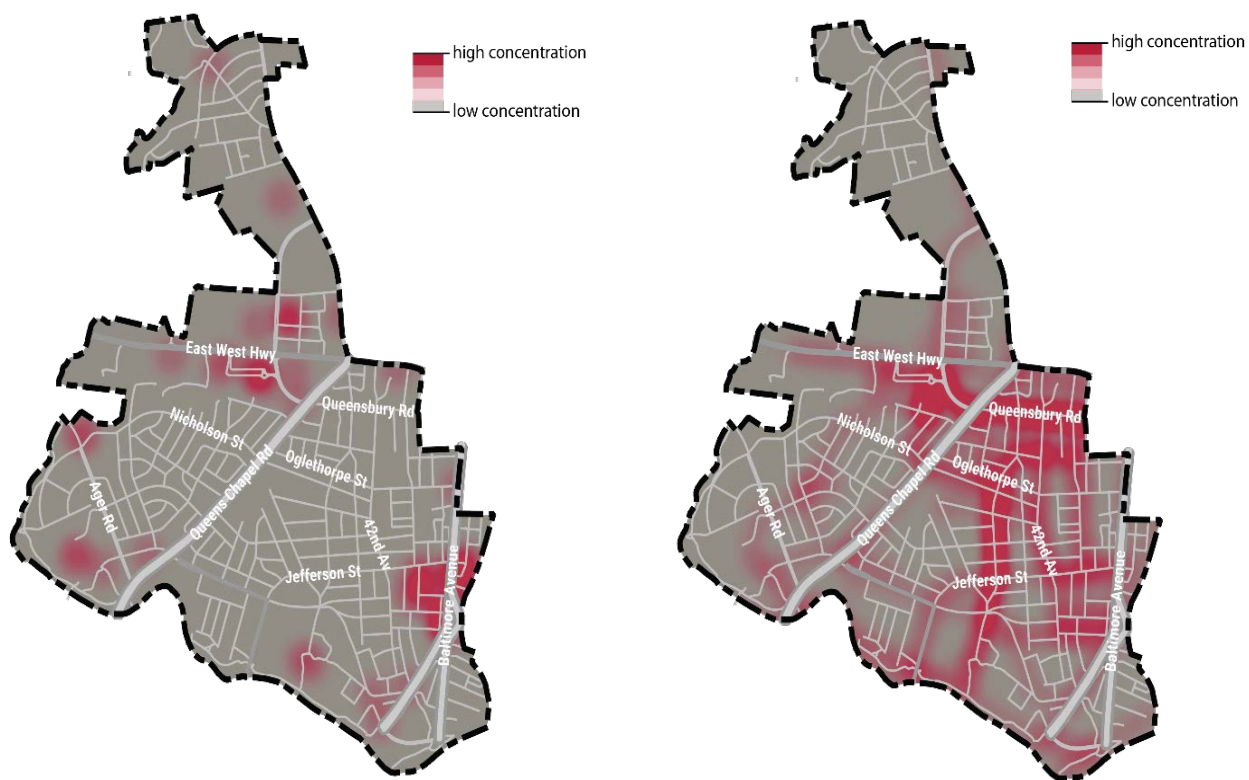


The wikimap received 47 comments related to the need for improved pedestrian and bicycle connectivity. Many of these comments focused on the need to provide better connections to the Northeast and Northwest Branch Trails, as well as the existing Trolley Trail. Other comments noted the need for additional sidewalk coverage, and more comfortable/safe crossings along Baltimore Avenue, Queens Chapel Road, and Rhode Island Avenue.

### *Destinations and Routes People Walk and Bike*

The wikimap receive 117 comments related to destinations and routes people walk and bike to/through. The West Hyattsville and Prince George's Plaza metro stations were among the most popular destinations along with the Arts District, Magruder Park and University Town Center.

**Figure 33: Destinations (left); Routes People Walk and Bike (right)**



### **Destinations**

### **Routes people walk and bike**

The routes receiving the highest number of comments included those with existing bicycle and pedestrian wayfinding. These include:

- Queensbury Road
- Belcrest Road
- 40<sup>th</sup> Avenue
- 42<sup>nd</sup> Avenue
- Oglethorpe Street



## 5. School Area Circulation Observations

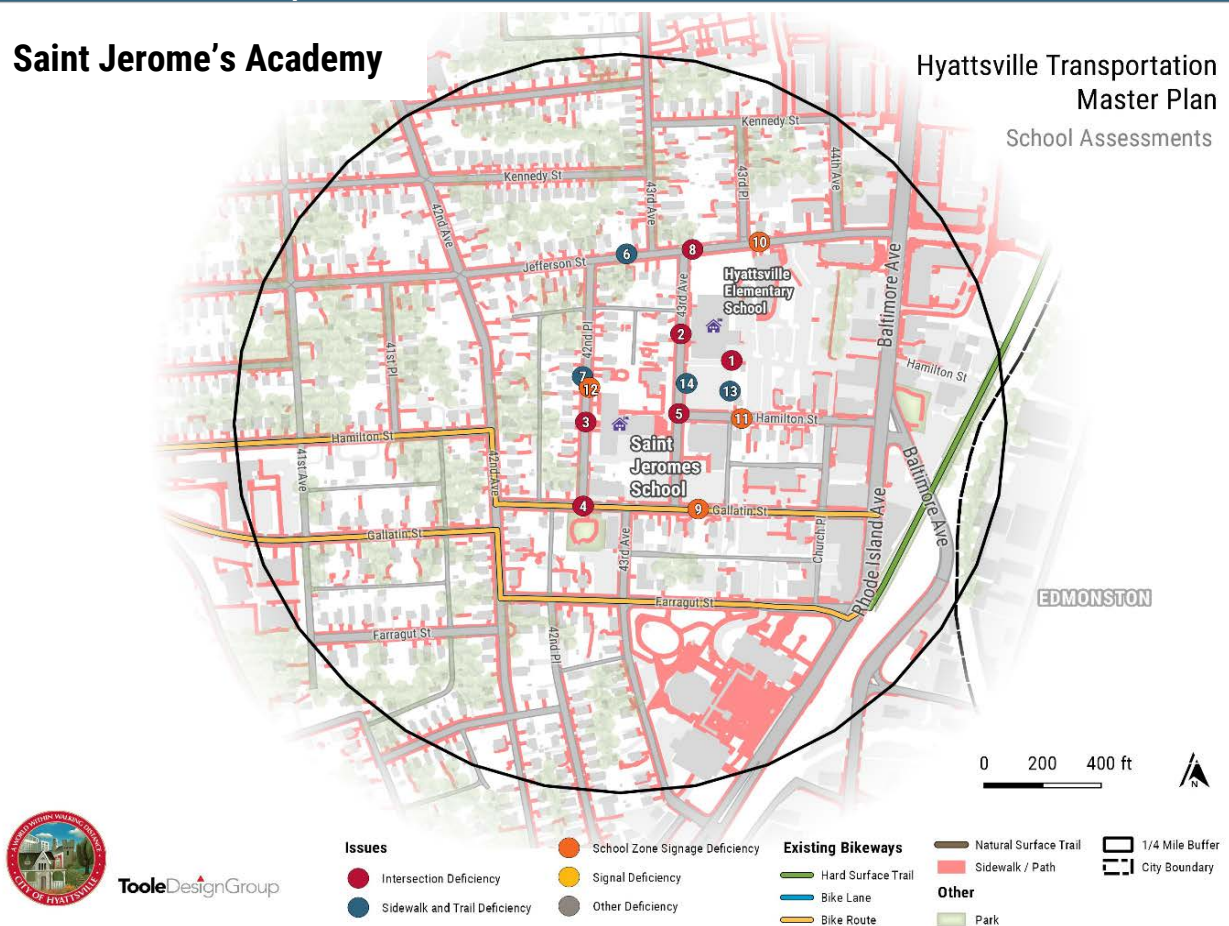
To assess multimodal connectivity and safety for students walking and biking to school, school area circulation observations were conducted between September 13 and 21, 2017. These field observations focused on documenting existing infrastructure within a ¼ mile radius around each of the following schools:

- St. Jerome Academy (5207 42<sup>nd</sup> Place)
- Hyattsville Elementary School (5311 43<sup>rd</sup> Avenue)
- Hyattsville Middle School (6001 42<sup>nd</sup> Avenue)
- Felegy Elementary School (6110 Editors Park Drive)
- Nicholas Orem Middle School (6100 Editors Park Drive)

The Study Team documented the arrival process for each of the schools between 7:00 and 9:30 am. As part of these observations, the Study Team also noted primary walking routes (within ¼ mile of school) as well as existing deficiencies in the street and sidewalk network representing obstacles for bicycling and walking to school. Infrastructure deficiencies maps for each school can be found below. Complete existing conditions reports were developed for each school and can be found in Appendix I-A.

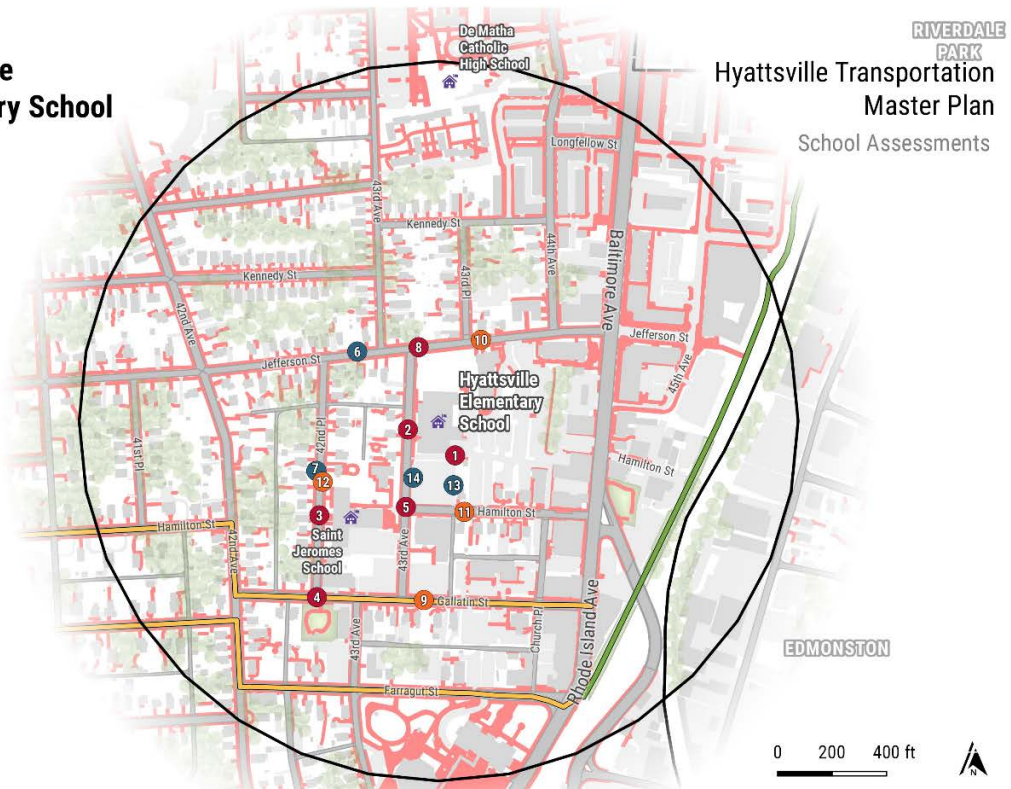
**Figure 34: School Area Deficiencies**

### Saint Jerome's Academy



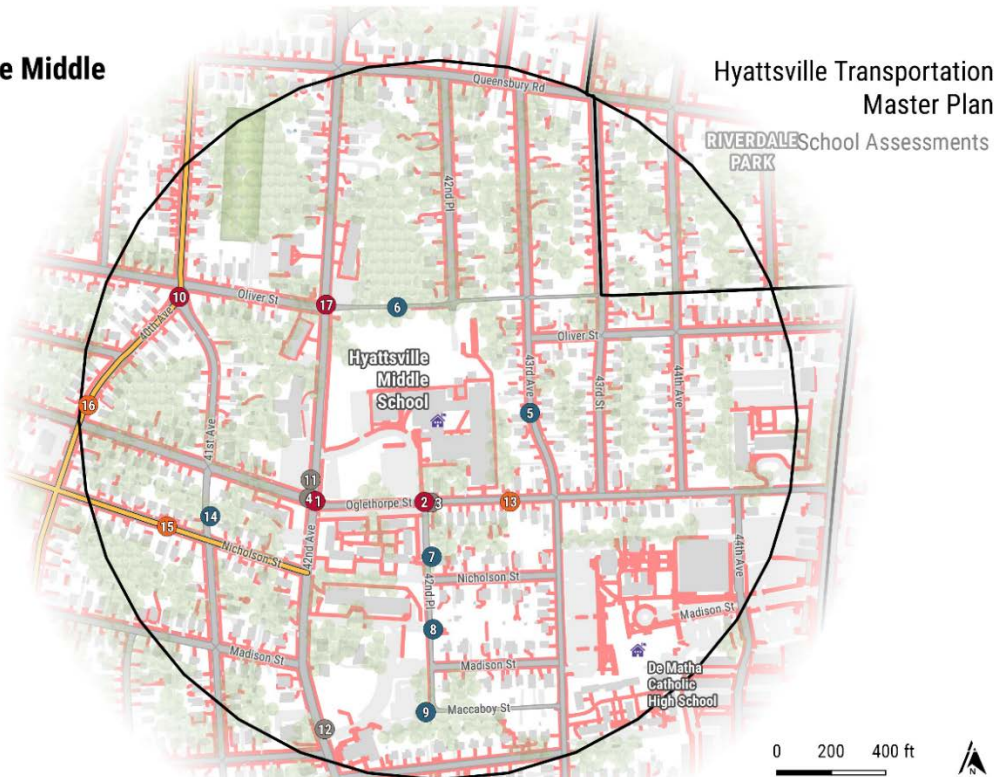
## Hyattsville Elementary School

## Hyattsville Transportation Master Plan School Assessments



## Hyattsville Middle School

## Hyattsville Transportation Master Plan School Assessments



TooleDesignGroup

- Issues**
- Intersection Deficiency
  - Sidewalk and Trail Deficiency
  - School Zone Signage Deficiency
  - Signal Deficiency
  - Other Deficiency

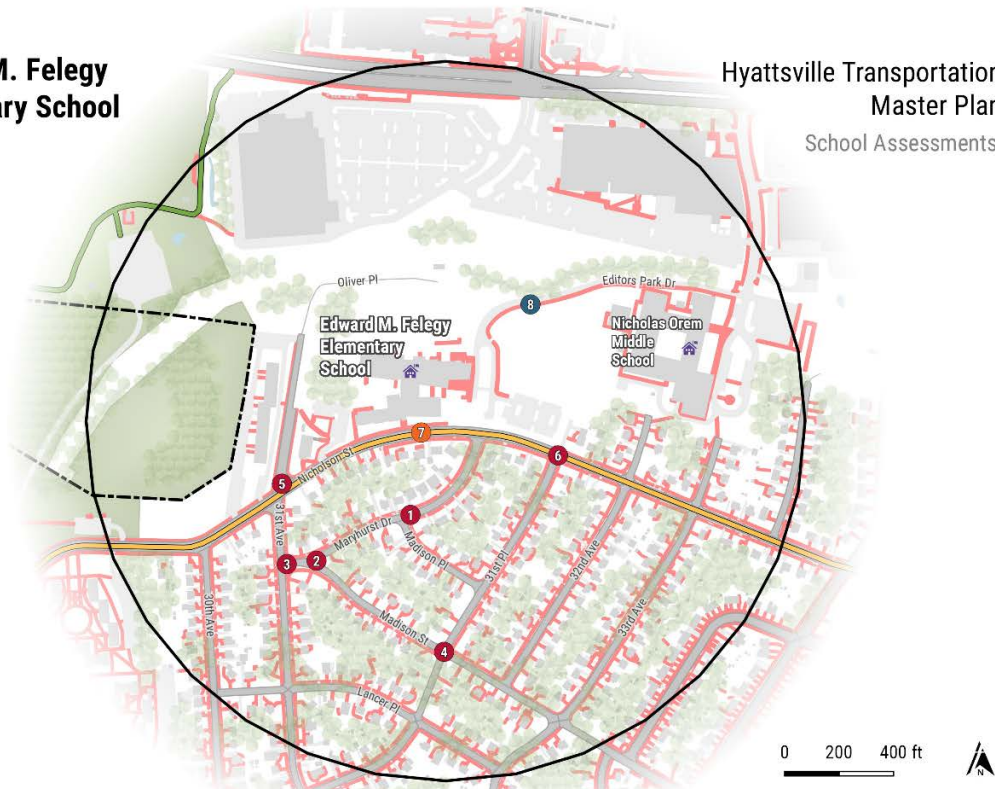
- Existing Bikeways**
- Hard Surface Trail
  - Bike Lane
  - Bike Route

- Other**
- Natural Surface Trail
  - Sidewalk / Path
  - 1/4 Mile Buffer
  - City Boundary
  - Park



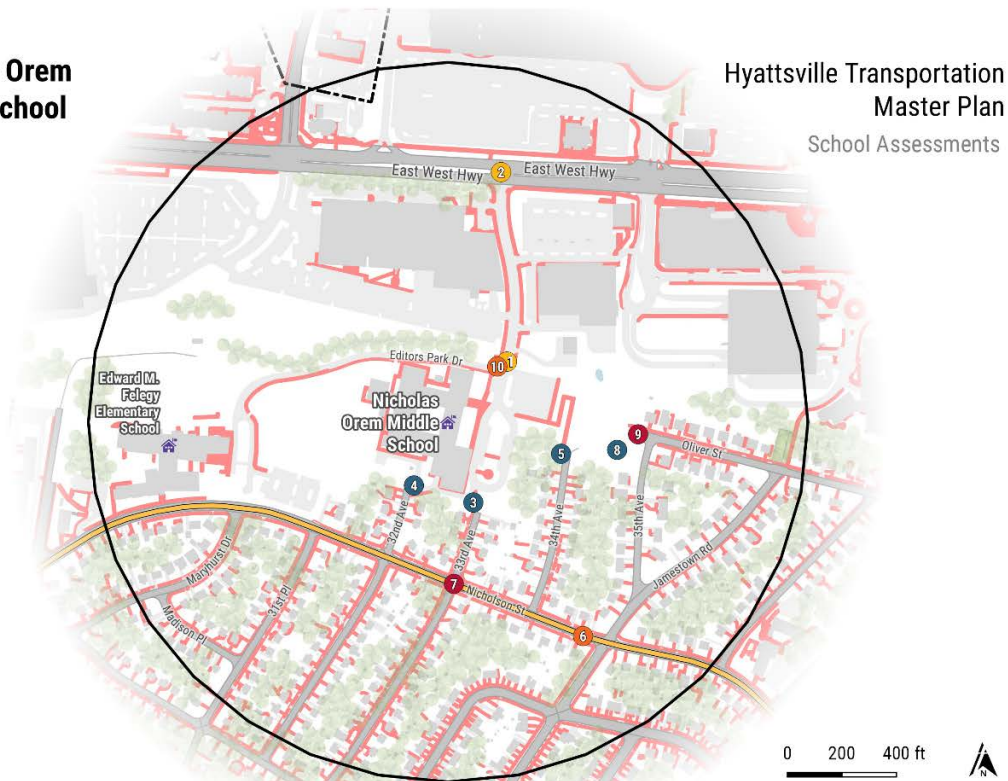
## Edward M. Felegy Elementary School

## Hyattsville Transportation Master Plan School Assessments



## Nicholas Orem Middle School

## Hyattsville Transportation Master Plan School Assessments



TooleDesignGroup

### Issues

- Intersection Deficiency
- Sidewalk and Trail Deficiency
- School Zone Signage Deficiency
- Signal Deficiency
- Other Deficiency

### Existing Bikeways

- Hard Surface Trail
- Bike Lane
- Bike Route

### Other

- Natural Surface Trail
- Sidewalk / Path
- Park

- 1/4 Mile Buffer
- City Boundary

The most common issues found throughout each of the schools included:

- Missing or deficient curb ramps
- Obstructions along sidewalks
- Narrow sidewalks
- Cars parked too close to intersections, decreasing pedestrian visibility
- Relatively high vehicle speeds along major walking/biking routes
- Missing “School Zone” speed restrictions signage
- Existing crosswalks below minimum MUTCD width standards.

As part of this process, the Study Team also developed a list of recommendations addressing specific issues around each of the schools. A list of prioritized projects per school was also developed. A complete report including observations and recommendations per school can be found in Appendix I-A.

## 6. Existing Motor Vehicle Traffic Conditions

The Study Team assessed the operation of existing traffic conditions related motor vehicle circulation in various corridors throughout the City. The following section provides a summary of conditions.

### Historical Traffic Data

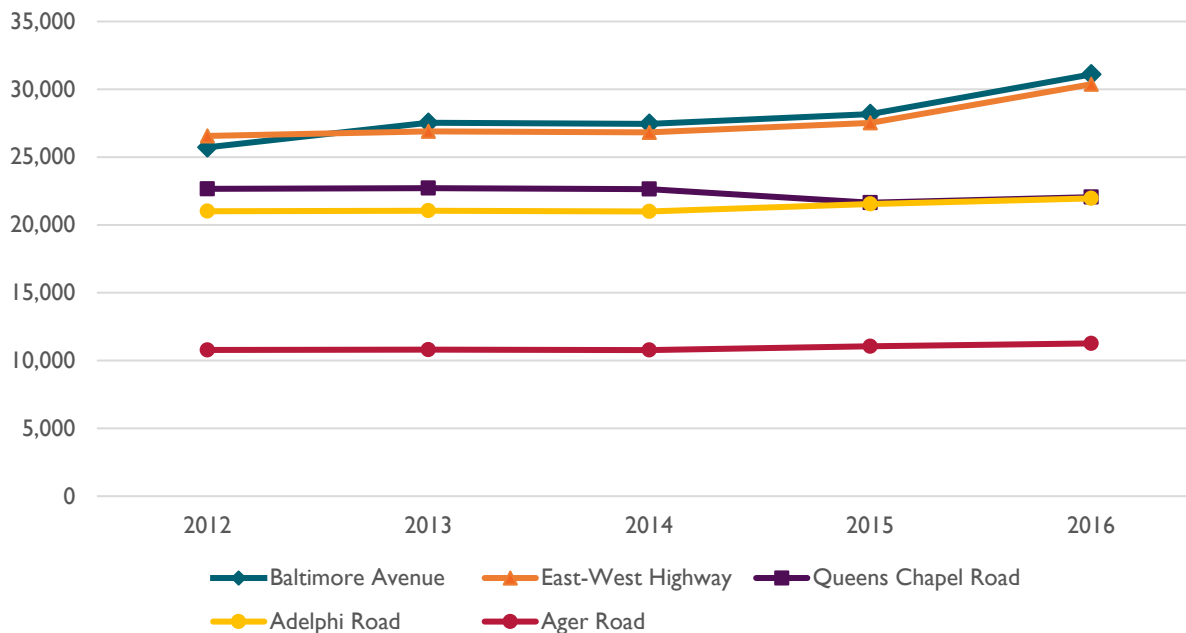
To understand the changes in traffic volumes and patterns over time, annual average daily traffic (AADT) volumes were examined for 2010 through 2016 – the most recent data available. AADTs are determined to provide an estimate of the daily bi-directional volumes at specific locations or along specific roadway corridors. AADT data was obtained from the SHA Statewide AADT Points website. AADT data was not available for Adelphi Road and Ager Road from 2010 to 2011. A summary of the historical AADT volumes is provided in Table 5. The trend of the AADT from 2012 to 2016 is illustrated in Figure 33 below.

**Table 5: Historical AADT Data**

| Road                        | Location                                       | Annual Average Daily Traffic Volumes |        |        |        |        |        |        |
|-----------------------------|------------------------------------------------|--------------------------------------|--------|--------|--------|--------|--------|--------|
|                             |                                                | 2010                                 | 2011   | 2012   | 2013   | 2014   | 2015   | 2016   |
| Baltimore Avenue (US 1)     | North of Hamilton Street                       | 25,830                               | 25,931 | 25,722 | 27,530 | 27,451 | 28,172 | 31,100 |
| East-West Highway (MD 410)  | West of Queens Chapel Road                     | 26,660                               | 26,771 | 26,562 | 26,900 | 26,821 | 27,522 | 30,370 |
| Queens Chapel Road (MD 500) | South of East-West Highway                     | 24,312                               | 21,120 | 22,660 | 22,711 | 22,642 | 21,640 | 22,051 |
| Adelphi Road                | North of East-West Highway                     | N/A                                  | N/A    | 21,010 | 21,051 | 20,992 | 21,543 | 21,954 |
| Ager Road                   | Between Hamilton Street and Queens Chapel Road | N/A                                  | N/A    | 10,780 | 10,801 | 10,772 | 11,053 | 11,264 |

The data shows that traffic volumes remained relatively steady between 2010 and 2014. Traffic volumes began to show growth in 2015, with the exception of traffic volumes on Queens Chapel Road, which decreased. Significant growth was observed from 2015 to 2016 on Baltimore Avenue (Route 1) and East-West Highway (MD 401). The historical AADT volumes will be used to help develop future traffic growth rates for the study area network.

**Figure 35: Historical Annual Average Daily Traffic Volumes**



### Traffic Data Collection

The following sections describe the traffic data collected for the purposes of conducting a traffic analysis as part of this study.

### Traffic Counts and Volumes

The following traffic data were acquired for 33 study intersections featured in Figure 34:

- Intersection turning movement count (TMC) data, including passenger vehicle, heavy vehicle, pedestrian, and bicycle counts
- Multiuse trail volume data

The TMCs for the 33 study intersections were acquired from two sources, including SHA and TMC data that was collected as a part of this study. TMCs were collected for this study for intersections where either the previous counts were not available, or the previous counts were conducted prior to 2015. As such, 23 of the 33 intersection TMCs were collected on October 11, 2017. A summary of TMC data is shown in Table 6.

The AM and PM peak hours for each study intersections are noted in Table 6. Based on the collected traffic data, the AM and PM peak periods were identified as 7:00 AM to 9:00 AM and 4:30 PM to 6:30 PM. This was determined by combining the traffic volumes for all intersections encompassing a majority of the individual intersection peak hours. Different corridors have slightly different peak hours. As such, the peak hour volumes at each intersection were analyzed to represent the highest through-put volumes. The existing 2017 peak hour volumes at the study intersections are provided in Appendix I-B.



**Figure 36: Study Intersections**



**Table 6: Intersection Traffic Count Summary**

| ID | Intersection                          | Date Collected | AM Peak Hour | PM Peak Hour | Source    |
|----|---------------------------------------|----------------|--------------|--------------|-----------|
| 1  | MD 500/Ager Rd                        | 9/14/2016      | 7:45-8:45    | 5:15-6:15    | SHA       |
| 2  | MD 500/Hamilton St                    | 10/11/2017     | 7:15-8:15    | 4:30-5:30    | Collected |
| 3  | MD 500/Nicholson St                   | 10/11/2017     | 7:15-8:15    | 4:30-5:30    | Collected |
| 4  | MD 500/Belcrest Rd/Queensbury Rd      | 10/11/2017     | 8:00-9:00    | 4:45-5:45    | Collected |
| 5  | MD 208(Hamilton St)/38th Ave          | 10/11/2017     | 7:30-8:30    | 4:45-5:45    | Collected |
| 6  | US 1/MD 410                           | 3/8/2016       | 7:15-8:15    | 5:15-6:15    | SHA       |
| 7  | US 1/Queensbury Rd                    | 10/11/2017     | 7:45-8:45    | 4:30-5:30    | Collected |
| 8  | US 1/Oglethorpe Rd                    | 10/11/2017     | 7:30-8:30    | 5:00-6:00    | Collected |
| 9  | US 1/Madison St                       | 10/11/2017     | 7:30-8:30    | 5:00-6:00    | Collected |
| 10 | US 1/Jefferson St                     | 10/11/2017     | 7:30-8:30    | 5:00-6:00    | Collected |
| 11 | US 1/Hamilton St (North)              | 10/11/2017     | 7:30-8:30    | 5:00-6:00    | Collected |
| 12 | US 1/Hamilton St (South)/US 1 Alt     | 8/18/2015      | 7:45-8:45    | 5:30-6:30    | SHA       |
| 13 | US 1 Alt/Decatur St                   | 10/11/2017     | 7:30-8:30    | 4:45-5:45    | Collected |
| 14 | US 1 Alt/Charles Armentrout St        | 10/11/2017     | 7:30-8:30    | 4:45-5:45    | Collected |
| 15 | US 1/Gallatin St                      | 10/11/2017     | 7:30-8:30    | 4:45-5:45    | Collected |
| 16 | US 1/Farragut St                      | 10/11/2017     | 7:15-8:15    | 4:45-5:45    | Collected |
| 17 | US 1/43rd Ave                         | 10/11/2017     | 7:30-8:30    | 4:45-5:45    | Collected |
| 18 | US 1/42nd Place/Crittenden St         | 10/11/2017     | 7:30-8:30    | 4:45-5:45    | Collected |
| 19 | US 1/41st Place/Charles Armentrout Dr | 8/18/2015      | 7:15-8:15    | 5:30-6:30    | SHA       |
| 20 | MD 410/Toledo Terrace                 | 2/25/2016      | 7:15-8:15    | 5:15-6:15    | SHA       |
| 21 | MD 410/Editors Park Dr                | 10/5/2016      | 7:00-8:00    | 5:45-6:45    | SHA       |
| 22 | MD 410/Prince George's Plaza          | 10/4/2016      | 8:45-9:45    | 5:00-6:00    | SHA       |
| 23 | MD 410/Belcrest Rd                    | 7/7/2015       | 8:15-9:15    | 5:15-6:15    | SHA       |
| 24 | MD 410/MD 500/Adelphi Rd              | 3/23/2016      | 8:00-9:00    | 6:00-7:00    | SHA       |
| 25 | Ager Rd/23rd Ave                      | 10/11/2017     | 7:00-8:00    | 5:00-6:00    | Collected |
| 26 | Ager Rd/Oglethorpe St/School          | 10/11/2017     | 7:00-8:00    | 5:00-6:00    | Collected |
| 27 | Ager Rd/Nicholson St                  | 10/11/2017     | 7:00-8:00    | 5:00-6:00    | Collected |
| 28 | Ager Rd/Hamilton St                   | 10/11/2017     | 7:30-8:30    | 5:00-6:00    | Collected |
| 29 | Toledo Rd/Belcrest Rd                 | 10/11/2017     | 8:00-9:00    | 5:00-6:00    | Collected |
| 30 | Adelphi Rd/Belcrest Rd                | 10/11/2017     | 7:45-8:45    | 4:45-5:45    | Collected |
| 31 | Adelphi Rd/Campus Dr                  | 4/5/2016       | 7:30-8:30    | 4:30-5:30    | SHA       |
| 32 | Adelphi Rd/Toledo Rd                  | 10/11/2017     | 7:30-8:30    | 5:00-6:00    | Collected |
| 33 | Hamilton St/40th Pl/39th Ave          | 10/11/2017     | 7:30-8:30    | 5:00-6:00    | Collected |

### Volume Balancing

As the TMC data were obtained from different sources, the traffic volumes were evaluated so that there are no irrational discrepancies between close-by intersections. The potential



imbalance of peak hour traffic volumes between intersections was assessed for all the study intersections. The following section summarizes the volume balancing strategies.

- In general, volumes are consistent for intersections where data were collected at the same time or where there are no mid-block driveways.
- Where counts were collected at different times, volume balancing was conducted to match the newly counted traffic data if applicable.
- If there were multiple driveways between adjacent study intersections, the magnitude of the imbalance was assessed to determine if the imbalance could be attributed to the driveways.

The list of intersection volumes that were balanced are shown in Table 7 below.

| <b>Table 7: Intersection Volumes Balanced</b> |           |           |
|-----------------------------------------------|-----------|-----------|
| <b>Intersections</b>                          | <b>AM</b> | <b>PM</b> |
| US 1/MD 410                                   | x         | x         |
| US 1/Jefferson St                             |           | x         |
| US 1/Hamilton St (South)/US 1 Alt             | x         | x         |
| US 1 Alt/Decatur St                           |           | x         |
| US 1/Farragut St                              | x         |           |
| US 1/41st Place/Charles Armentrout Dr         | x         | x         |
| MD 410/Editors Park Dr                        | x         | x         |
| MD 410/Prince George's Plaza                  | x         | x         |
| MD 410/Belcrest Rd                            | x         | x         |
| MD 410/MD 500/Adelphi Rd                      | x         | x         |
| Ager Rd/23rd Ave                              | x         | x         |

### Intersection Traffic Control and Lane Configurations

The existing traffic controls are described in Table 8 and detailed intersection lane configurations are provided in Appendix I-C. Intersection lane configurations were verified using 2017 Google Maps.

### Traffic Signal Timings

Existing signal timings for most of the study intersections were obtained either from the 2010 Hyattsville Transportation Study (within the Synchro models prepared for that study) or from SHA in PDF format. Signal timing data for the remaining intersections under Prince George's County jurisdiction were obtained from recent traffic studies in the area. PDF files were compared against the Synchro models to verify the correct intersection coding and operations. The Synchro files were used to import signal timing parameters into the Vistro models.

**Table 8: Study Intersections and Existing Traffic Control**

| ID | Intersection                          | Traffic Control     |
|----|---------------------------------------|---------------------|
| 1  | MD 500/Ager Rd                        | SHA Signalized      |
| 2  | MD 500/Hamilton St                    | SHA Signalized      |
| 3  | MD 500/Nicholson St                   | SHA Unsignalized    |
| 4  | MD 500/Belcrest Rd/Queensbury Rd      | SHA Signalized      |
| 5  | MD 208(Hamilton St)/38th Ave          | SHA Signalized      |
| 6  | US 1/MD 410                           | SHA Signalized      |
| 7  | US 1/Queensbury Rd                    | SHA Signalized      |
| 8  | US 1/Oglethorpe Rd                    | SHA Signalized      |
| 9  | US 1/Madison St                       | SHA Signalized      |
| 10 | US 1/Jefferson St                     | SHA Signalized      |
| 11 | US 1/Hamilton St (North)              | SHA Signalized      |
| 12 | US 1/Hamilton St (South)/US 1 Alt     | SHA Signalized      |
| 13 | US 1 Alt/Decatur St                   | SHA Signalized      |
| 14 | US 1 Alt/Charles Armentrout St        | SHA Unsignalized    |
| 15 | US 1/Gallatin St                      | SHA Signalized      |
| 16 | US 1/Farragut St                      | SHA Signalized      |
| 17 | US 1/43rd Ave                         | SHA Unsignalized    |
| 18 | US 1/42nd Place/Crittenden St         | SHA Signalized      |
| 19 | US 1/41st Place/Charles Armentrout Dr | SHA Signalized      |
| 20 | MD 410/Toledo Terrace                 | SHA Signalized      |
| 21 | MD 410/Editors Park Dr                | SHA Unsignalized    |
| 22 | MD 410/Prince George's Plaza          | SHA Signalized      |
| 23 | MD 410/Belcrest Rd                    | SHA Signalized      |
| 24 | MD 410/MD 500/Adelphi Rd              | SHA Signalized      |
| 25 | Ager Rd/23rd Ave                      | County Signalized   |
| 26 | Ager Rd/Oglethorpe St/School          | County Signalized   |
| 27 | Ager Rd/Nicholson St                  | County Unsignalized |
| 28 | Ager Rd/Hamilton St                   | County Signalized   |
| 29 | Toledo Rd/Belcrest Rd                 | County Signalized   |
| 30 | Adelphi Rd/Belcrest Rd                | County Signalized   |
| 31 | Adelphi Rd/Campus Dr                  | County Signalized   |
| 32 | Adelphi Rd/Toledo Rd                  | County Signalized   |
| 33 | Hamilton St/40th Pl/39th Ave          | County Unsignalized |

## Measures of Effectiveness

Traffic analysis was performed using PTV Vistro, a macroscopic analysis tool that uses Highway Capacity Manual (HCM) methodologies to calculate operational performance at signalized and unsignalized intersections. Because Vistro is deterministic program, it is not capable of capturing queue spillover and impact to adjacent intersections. As a result, operational results for some of the closely-spaced intersections do not represent field observed operations. This section documents such conditions. The following measures of effectiveness (MOE) were considered for this study:

- Movement/approach/overall intersection delay;
- Movement/approach/overall intersection Level of Service (LOS); and
- 95<sup>th</sup>-percentile movement/approach queues, based on Vistro HCM outputs

The Highway Capacity Manual (HCM) defines LOS for signalized and unsignalized intersections as a function of average vehicle control delay. LOS may be calculated per movement or per approach for any intersection configuration, but overall intersection LOS is defined for signalized and all-way stop-controlled intersections only. Overall intersection LOS is not reported for two-way stop-controlled intersections. Table 9 and Table 10 summarize the different LOS designations for both signalized and unsignalized intersections, respectively, based on vehicle delay and volume to capacity ratio. The existing conditions LOS, delay, and queuing analyses for the AM and PM peak hours are discussed in the following sections.

**Table 9: LOS and Delay Thresholds, Signalized Intersections**

| Level of Service (LOS) | Average Control Delay (seconds) | General Description                                                                                                 |
|------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------|
| A                      | ≤10                             | Free flow                                                                                                           |
| B                      | >10-20                          | Stable flow (slight delays)                                                                                         |
| C                      | >20-35                          | Stable flow (acceptable delays)                                                                                     |
| D                      | >35-55                          | Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding) |
| E                      | >55-80                          | Unstable flow (intolerable delay)                                                                                   |
| F                      | >80                             | Forced flow (congested and queues fail to clear)                                                                    |

**Table 10: LOS and Delay Thresholds, Unsignalized Intersections**

| Level of Service (LOS) | Average Control Delay (seconds) |
|------------------------|---------------------------------|
| A                      | 0-10                            |
| B                      | >10-15                          |
| C                      | >15-25                          |
| D                      | >25-35                          |
| E                      | >35-50                          |
| F                      | >50                             |

In addition to the LOS and delay MOEs, 95<sup>th</sup>-percentile queues per movement were also evaluated. The 95<sup>th</sup> percentile queues are particularly useful for traffic operations evaluation, as they represent the maximum queue lengths that are anticipated for 95 percent of the peak hour period at each location while removing potential outliers that may skew the analysis results.

### Traffic Operational Results

The existing conditions overall intersection delay and LOS outputs are summarized in Table I I. Figure 35 and Figure 36 provide a summary of existing LOS for AM and PM peak hours at the various study intersections. It should be noted that in vibrant urban environments, it is relatively rare for intersections to operate at LOS B or better during the peak hours. Generally, intersections operating at LOS D or better are considered acceptable, while intersections operating at LOS E and F are cause for concern. The existing conditions volume, delay, and LOS by movement is provided in Appendix I-D. Degraded (LOS E/F) operations for overall intersections and individual movements are highlighted in red. Vistro HCM reports are provided in Appendix I-E.

As shown in Table I I and Appendix I-D more than half of the study intersections currently operate at an overall LOS C or better and with moderate delays for individual movements. However, several intersections experience significant delay due to congestion related to commuting traffic. For intersections that generally operate at acceptable LOS, certain movements (such as left turns) may operate poorly. The 95<sup>th</sup> percentile queue length for each movement at the intersections were compared with available storage for turn lanes and between adjacent intersections. The results of 95<sup>th</sup> percentile queues were reported in Appendix I-F. The following section describes the existing traffic operational deficiencies based on delay and 95<sup>th</sup>-percentile queue results.

Several arterial corridors in the study area serve as regional commuting corridors to destinations beyond the City of Hyattsville. This section describes the traffic operational issues at the study intersections along these major arterial corridors.

### Baltimore Avenue (US I) and US I Alternate

Baltimore Avenue serves as a commuter route for drivers traveling between Washington D.C. and points north such as the University of Maryland and suburban Maryland. The right-of-way is constrained on Baltimore Avenue in the study area and some intersections do not contain dedicated left-turn lanes. The intersection spacing and access also impact operations on the corridor, with side streets movements affecting arterial traffic flow. A small number of intersections on Baltimore Avenue or Route I Alternate operate at degraded conditions (LOS E or worse) as described below.

- Baltimore Avenue (Route I)/East-West Highway
- Baltimore Avenue/Route I Alternate/Hamilton Street South
- Route I Alternate/Charles Armentrout Street

**Table I I: Existing (2017) Intersection Delay and LOS**

| ID | Intersection                          | Traffic Control     | AM Peak Hour Delay | AM Peak Hour LOS | PM Peak Hour Delay | PM Peak Hour LOS |
|----|---------------------------------------|---------------------|--------------------|------------------|--------------------|------------------|
| 1  | MD 500/Ager Rd                        | SHA Signalized      | 25.8               | C                | 22.2               | C                |
| 2  | MD 500/Hamilton St                    | SHA Signalized      | 28.6               | C                | 40.9               | D                |
| 3  | MD 500/Nicholson St                   | SHA Unsignalized    | Significant        | F                | Significant        | F                |
| 4  | MD 500/Belcrest Rd/Queensbury Rd      | SHA Signalized      | 18.7               | B                | 25.9               | C                |
| 5  | MD 208(Hamilton St)/38th Ave          | SHA Signalized      | 26.3               | C                | 29.4               | C                |
| 6  | US 1/MD 410                           | SHA Signalized      | 72.7               | E                | 112.6              | F                |
| 7  | US 1/Queensbury Rd                    | SHA Signalized      | 16.4               | B                | 19.0               | B                |
| 8  | US 1/Oglethorpe Rd                    | SHA Signalized      | 10.4               | B                | 5.1                | A                |
| 9  | US 1/Madison St                       | SHA Signalized      | 16.2               | B                | 10.2               | B                |
| 10 | US 1/Jefferson St                     | SHA Signalized      | 16.7               | B                | 11.4               | B                |
| 11 | US 1/Hamilton St (North)              | SHA Signalized      | 1.4                | A                | 2.0                | A                |
| 12 | US 1/Hamilton St (South)/US 1 Alt     | SHA Signalized      | 234.7              | F                | 53.9               | D                |
| 13 | US 1 Alt/Decatur St                   | SHA Signalized      | 20.1               | C                | 12.0               | B                |
| 14 | US 1 Alt/Charles Armentrout St        | SHA Unsignalized    | Significant        | F                | Significant        | F                |
| 15 | US 1/Gallatin St                      | SHA Signalized      | 3.6                | A                | 1.4                | A                |
| 16 | US 1/Farragut St                      | SHA Signalized      | 9.7                | A                | 9.7                | A                |
| 17 | US 1/43rd Ave                         | SHA unsignalized    | 32.0               | D                | 20.1               | C                |
| 18 | US 1/42nd Place/Crittenden St         | SHA Signalized      | 20.8               | C                | 30.9               | C                |
| 19 | US 1/41st Place/Charles Armentrout Dr | SHA Signalized      | 31.8               | C                | 20.1               | C                |
| 20 | MD 410/Toledo Terrace                 | SHA Signalized      | 128.0              | F                | 96.8               | F                |
| 21 | MD 410/Editors Park Dr                | SHA Unsignalized    | 95.9               | F                | Significant        | F                |
| 22 | MD 410/Prince George's Plaza          | SHA Signalized      | 12.2               | B                | 21.8               | C                |
| 23 | MD 410/Belcrest Rd                    | SHA Signalized      | 48.7               | D                | 91.0               | F                |
| 24 | MD 410/MD 500/Adelphi Rd              | SHA Signalized      | 85.9               | F                | 155.4              | F                |
| 25 | Ager Rd/23rd Ave                      | County Signalized   | 26.7               | C                | 17.1               | B                |
| 26 | Ager Rd/Oglethorpe St/School          | County Signalized   | 28.7               | C                | 34.9               | C                |
| 27 | Ager Rd/Nicholson St                  | County Unsignalized | 260.0              | F                | Significant        | F                |
| 28 | Ager Rd/Hamilton St                   | County Signalized   | 11.4               | B                | 17.1               | B                |
| 29 | Toledo Rd/Belcrest Rd                 | County Signalized   | 8.7                | A                | 13.9               | B                |
| 30 | Adelphi Rd/Belcrest Rd                | County Signalized   | 17.7               | B                | 51.3               | D                |
| 31 | Adelphi Rd/Campus Dr                  | County Signalized   | 28.8               | C                | 105.5              | F                |
| 32 | Adelphi Rd/Toledo Rd                  | County Signalized   | 5.9                | A                | 9.2                | A                |
| 33 | Hamilton St/40th Pl/39th Ave          | County Unsignalized | 10.3               | B                | 12.3               | B                |



Figure 37: Level of Service (AM Peak)







Despite operating at acceptable LOS, the following intersections experience significant queue lengths.

- Baltimore Avenue (Route 1)/Madison Street (southbound queue spills back to Oglethorpe Street during AM peak hour)
- Rhode Island Avenue (Route 1)/Crittenden Street (both peak hours)

The intersection of Baltimore Avenue (Route 1) and East-West Highway (MD 410) is among the worst-performing intersections in the study area for both peak hours. The oversaturated conditions on all four approaches were attributable to significant through/right-turn volumes and high left-turn volumes opposing the through volumes. The northbound 95<sup>th</sup>-percentile queue spillover impacts Queensbury Road intersection during both AM and PM peak hours. The eastbound 95<sup>th</sup>-percentile queue extends close to the Queens Chapel Road intersection during PM peak hour.

The lack of dedicated southbound left-turn lane on Baltimore Avenue at US 1 Alternate caused significant delay and queuing during both AM and PM peak hour. The heavy use of Route 1 Alternate as a bypass route resulted in large turning volumes between Baltimore Avenue (north) at Route 1 Alternate. During both peaks, the northbound and southbound queue on Baltimore Avenue spills back to adjacent intersections constantly and northbound right-turn queue from Route 1 Alternate extends as far as Decatur Street.

The unsignalized intersection of Route 1 Alternate and Charles Armentrout Street has significant operational and safety issues. Large eastbound right-turn and northbound left-turn volumes travel through this intersection during both the AM and PM peaks; the eastbound left-turn on Charles Armentrout Street is stop-controlled and does not have sufficient gap time to cross the intersection due to large volumes of opposing movements and sight distance which is constrained by the adjacent bridge structure.

The 95<sup>th</sup> percentile queues on eastbound Crittenden Street at Baltimore Avenue were significant due to large volume of turning traffic under the skewed intersection. The Crittenden Street approach operates as split phases with the 42<sup>nd</sup> Place approach, which reduces the green-time allowed for both approaches, resulting in longer queues.

### Queens Chapel Road and Adelphi Road

Queens Chapel Road serves as a commuter route for traffic heading in and out of Washington, D.C. and Adelphi Road serves as a major route to and from I-495 and the University of Maryland. As such, high demand corresponds to increased congestion. As shown in Table 8, the three intersections listed below experience significant delays in the AM and/or PM peak hour.

- Campus Drive/Adelphi Road
- East-West Highway (MD 410)/Queens Chapel Road (MD 500)/Adelphi Road
- Queens Chapel Road (MD 410)/Nicholson Street

The following intersections, despite operating at acceptable LOS, experience extensive queues.

- Belcrest Road/ Adelphi Road
- Queens Chapel Road/Hamilton Street

At the Campus Drive/Adelphi Road intersection, the southbound 95<sup>th</sup>-percentile queue on Adelphi Road spills back to University Boulevard; the other three approaches also have extensive queues and significant delay (LOS E/F) during the PM peak hour. The signal operates a reservice for the southbound approach phase (served twice in one signal cycle) to help clear queues in the short block on Adelphi Road between Campus Drive and University Boulevard, which adversely impacts other approaches during PM peak.

At Belcrest Road/Adelphi Road intersection, eastbound left-turn and southbound right-turn carry significant amount of traffic and the 95<sup>th</sup>-percentile queue on eastbound Belcrest Road was extensive during the PM peak hour. This could potentially be due to Belcrest Road being used to avoid the East-West Highway (MD 410) and Adelphi Road intersection.

East-West Highway (MD 410)/Queens Chapel Road (MD 500)/Adelphi Road intersection is among the most congested intersections in the study area, particularly during the PM peak hours. The Adelphi Road and Queens Chapel Road (MD 500) approaches experience significant delays (LOS F in both peaks). The eastbound approach operates at LOS F during the PM peak hours. The northbound approach does not have dedicated left-turn lane and the split phasing results in high delay on Adelphi Road. The skewed roadway geometry on Adelphi Road and Queens Chapel Road (MD 500) creates safety and operational challenges. Southbound left-turn and westbound left-turn movements and opposing through movements carry significant volumes. As such, the northbound and eastbound 95<sup>th</sup>-percentile queues extend close to the adjacent intersections during the PM peak hour.

Queens Chapel Road (MD 500)/Nicholson Street intersection is currently unsignalized and Nicholson Street experienced significant delay due to stop control and lack of adequate gap in the north-south traffic stream.

The eastbound and westbound approach 95<sup>th</sup>-percentile queues on Hamilton Street at Queens Chapel Road (MD 500) spill back to adjacent intersection in both the AM and PM peak hours.

### East-West Highway (MD 410)

East-West Highway serves a major east-west corridor for commuters heading to and from Silver Spring and for non-work related trips to the Mall at Prince George's. The majority of the intersections in the study area on East-West Highway operate at congested conditions, either on the mainline or on the side streets due to long cycle length and high volumes.

When crossing other major roadways, such as Queens Chapel Road (MD 500) and Baltimore Avenue (Route 1), East-West Highway experiences high delay. As previously described, the eastbound and westbound approaches operate at congested traffic conditions (LOS E/F) in both peak hours. The queues that are not cleared in one signal cycle adversely affect signal progression under oversaturated conditions.



At minor streets, such as at Toledo Terrace and Editors Park Drive, East-West Highway occupies a significant amount of green time, and side streets delays are significant. Toledo Terrace has permissive phasing for left-turn movements while Editors Park Drive is stop-controlled. The intersection of Belcrest Road and East-West Highway operates at oversaturated conditions due to high volumes on all four approaches and split phasing on Belcrest Road. The operation of the intersection may be improved by removing the split phase for the minor street approaches.

During PM peak hour, 95<sup>th</sup> percentile queues on East-West Highway at most of the study intersections extend close to adjacent intersections. During both peaks, side street queues are significant, particularly on Toledo Terrace and southbound Belcrest Road, which extend beyond Freedom Way.

### Ager Road

Ager Road/Nicholson Street intersection may warrant a signal due to high delay and significant queues on the stop-controlled side street. Nicholson Street provides access to Edward M. Felegy Elementary School and Nicholas Orem Middle School which results in high traffic peaks during pick-up and drop-off times. The 95<sup>th</sup>-percentile queue at the eastbound right-turn lane of the Ager Road and Queens Chapel Road (MD 500) extends close to Hamilton Street during the AM peak hour due to heavy commuting traffic into D.C.

### Exceptions in Operational Results

Field observations contradict the operational performance of the following three intersections derived from Vistro:

- Baltimore Avenue/Hamilton Street (north) (both peak hours)
- East-West Highway/Editors Park Drive (both peak hours)
- East-West Highway/Prince George's Mall (PM peak hour)

Significant congestion was observed in the field, with vehicles experiencing signal delay over multiple cycles, even though the VISTRO analysis showed that the intersection was operating at LOS D or better. This can be attributed to several factors:

- Vistro analyses are based upon TMC data, which only captures vehicles passing through the intersection during the peak hour. When demand is much higher in the field and the intersection is not able to process the actual vehicular demand during the peak hour, the TMC data collected can reflect lower traffic volume than the demand at the intersection.
- Vistro cannot accurately capture lane utilization or lane changing behavior. In the field, there was much higher utilization of lanes at certain intersections due to upstream and/or downstream lane configuration, which can result in longer delays and queues.
- Vistro analyses do not account for downstream congestion of adjacent intersections. Queue spillback from these adjacent facilities reduces actual throughput, increasing delay.

## 7. Origin-Destination Analysis

To understand traffic patterns throughout the city based on the number of local and regional destinations and trip generators, the Study Team conducted an origin-destination analysis using data collected by StreetLight Data, a company that aggregates cell-phone data for specific use in transportation planning. The company uses the anonymized location and time stamp of data to calculate origin and destination of the cell-phone user. The company produces an index based on normalized traffic volumes that can be used to compare traffic volumes across different areas (or zones) in a city. It should be noted that the index is not actual traffic count and does not represent the actual number of trips. The analysis helped answer the following questions:

- In general, what percent of trips originate in Hyattsville and end outside the City?
- For travel within the City, which origin-destination (OD) pair has the highest trips? Are these short distance trips, and, therefore, could they potentially be converted to walking or bicycling trips?
- For local streets with high traffic volumes (as identified by Wikimap respondents), which OD pair has the most impact on these specific roadways?

The following section describes the methodology used and the findings from this research.

### Methodology:

To begin with the analysis, the Study Team worked with city staff to define context-sensitive origin-destination zones that considered land use and roadway functional classification. A total of 16 zones, as shown in Figure 37, were identified. Two additional zones were added to capture trips traveling to/from Maryland and the DC/Virginia areas. In addition to these zones, a set of filters were created to distill traffic data along following corridors:

- |                                                            |                               |
|------------------------------------------------------------|-------------------------------|
| • Ager Road (2 filters)                                    | • Queensbury Road (2 filters) |
| • Nicholson Street, west of Queens Chapel Road (2 filters) | • Hamilton Street (2 filters) |
| • Nicholson Street, east of Queens Chapel Road             | • Jefferson Street            |
| • Belcrest Road, north of Hwy 410                          | • Hamilton Street             |
| • Belcrest Road, south of Hwy 410                          | • 40 <sup>th</sup> Place      |
|                                                            | • 42 <sup>nd</sup> Avenue     |
|                                                            | • 43 <sup>rd</sup> Avenue     |

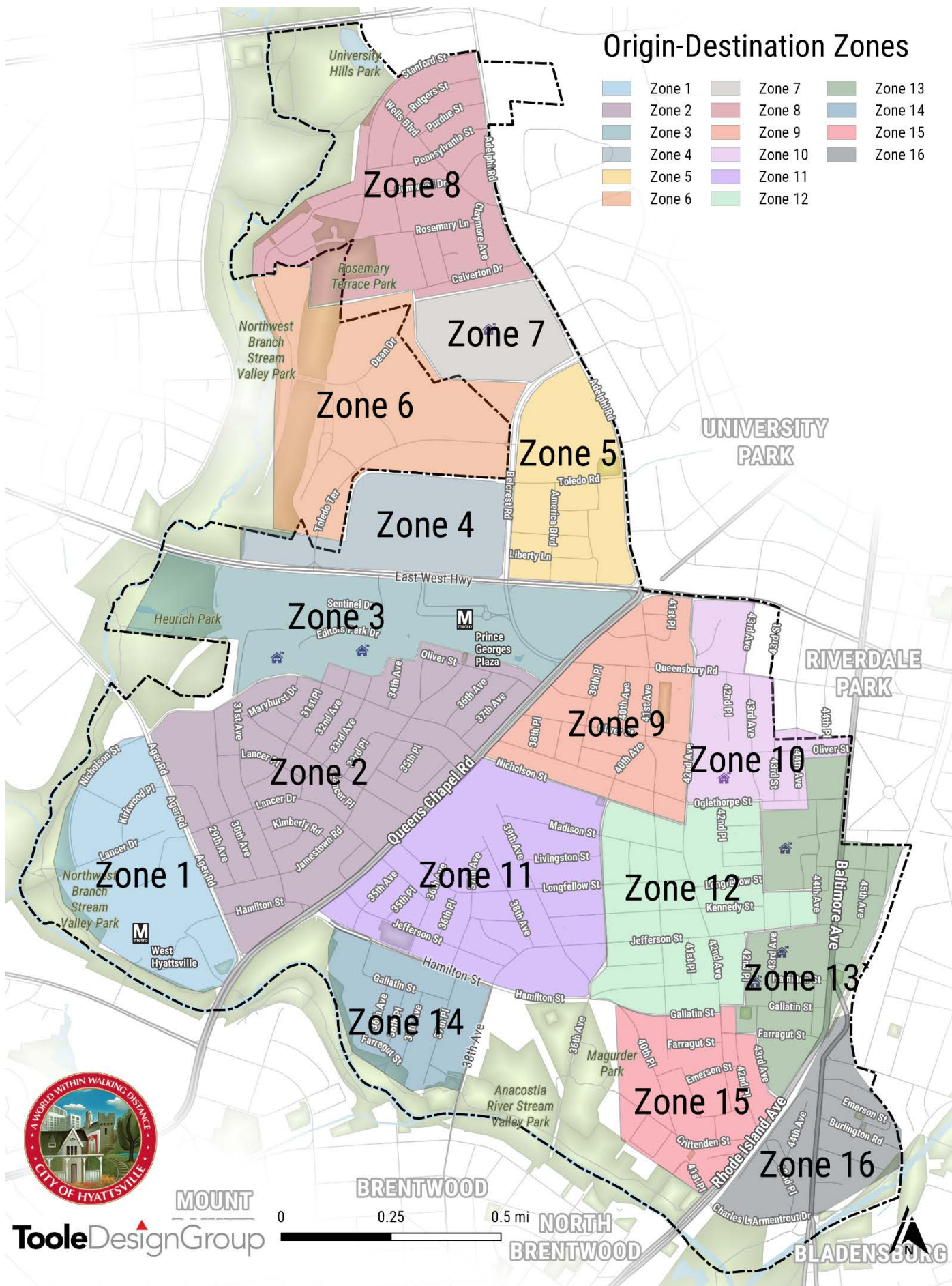
StreetLight data were obtained for 12-month period, from September 2016 to August 2017. To assess the travel pattern during a regular work-day, average daily data from Monday to Friday were analyzed. Furthermore, in an effort to understand after-work travel pattern, data between the hours of 6:00 and 9:00 pm were also analyzed.

### Results

To better understand the travel patterns within the City, the results have been organized in to two area-based groups: regional and local.



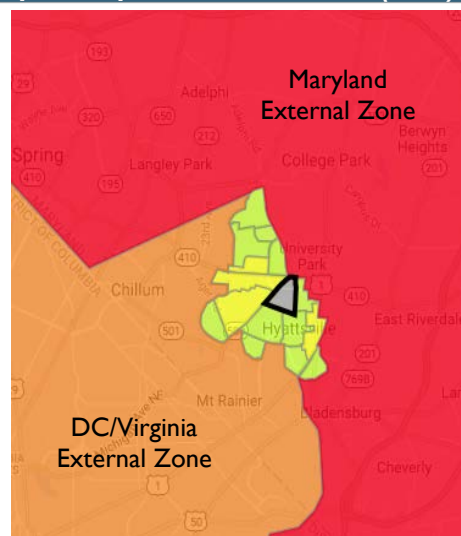
Figure 39: Origin-Destination Zones for Analysis



## Regional Results

Regional travel patterns were obtained by averaging the OD rates for each of the 16 internal zones in the City with the two external zones that represented D.C./Virginia and Maryland. The average rates were used to understand the aggregated regional travel pattern of residents and visitors of Hyattsville. Figure 38 shows an example regional travel pattern of one of the internal zones (shown in Blue) showing high (Red) origin rate for Maryland and low (Green) origin rate for DC/Virginia. Table 12 shows the average origin rate showing percentage of trips from Hyattsville to the two external zones, as well as to other zones within Hyattsville.

**Figure 40: Example Regional Travel Pattern of One of the Internal Zones (Blue)**



**Table 12: Average Origin Rates**

|                              | To Hyattsville | To DC + Virginia | To Maryland |
|------------------------------|----------------|------------------|-------------|
| From Hyattsville, daily avg. | 15.1%          | 32.9%            | 52.0%       |
| From Hyattsville, 6-9pm, M-F | 16.2%          | 30.6%            | 53.3%       |

The results of the regional trip analysis showed that during an average weekday approximately 15 percent of all trips originating within the city, end within the city. During the after-work hours (6:00 to 9:00 p.m.) the trend continued with only approximately 16 percent of traffic traveling inside Hyattsville. Conversely, most trips originating in Hyattsville were going to Washington, DC or Virginia (32.9 percent) or other destinations in Maryland (52 percent).

Table 13 below lists the destination rates, by percent, of trips ending in Hyattsville. The table shows that during an average weekday, of all traffic travelling to Hyattsville, approximately 16 percent comes from within Hyattsville. In the evening (6:00 to 9:00 pm) hours during the weekday, approximately 19 percent of traffic comes from within Hyattsville.

The result of the regional travel pattern analysis indicates that even during the after-work hours, vast majority of Hyattsville residents and visitors do not spend time in the City.



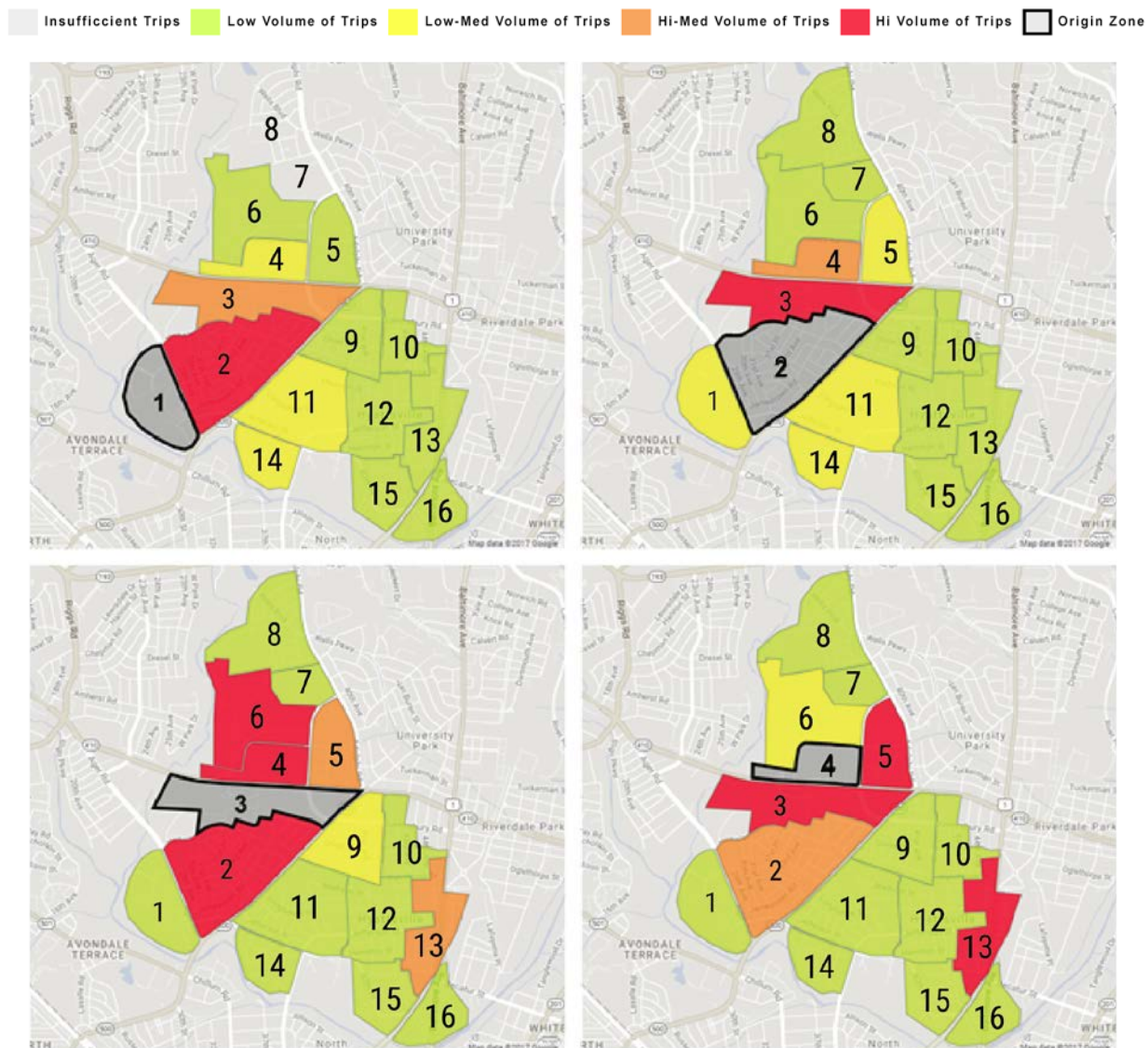
**Table 13: Average Destination Rates**

|                            | From Hyattsville | From DC + Virginia | From Maryland |
|----------------------------|------------------|--------------------|---------------|
| To Hyattsville, daily avg. | 16.2%            | 33.5%              | 50.9%         |
| To Hyattsville, 6-9pm, M-F | 18.6%            | 33.5%              | 47.9%         |

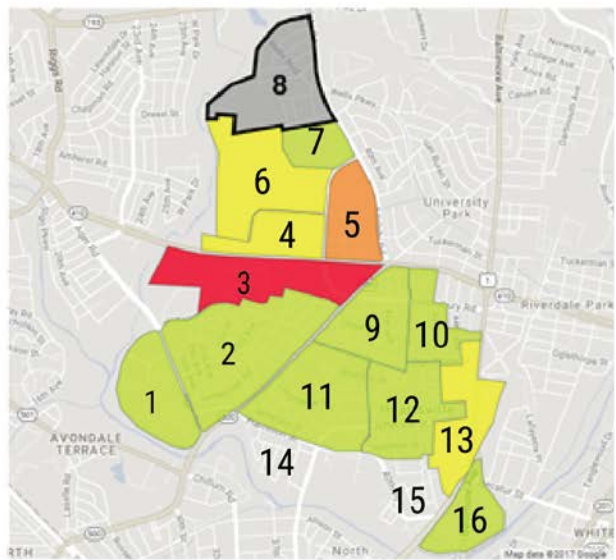
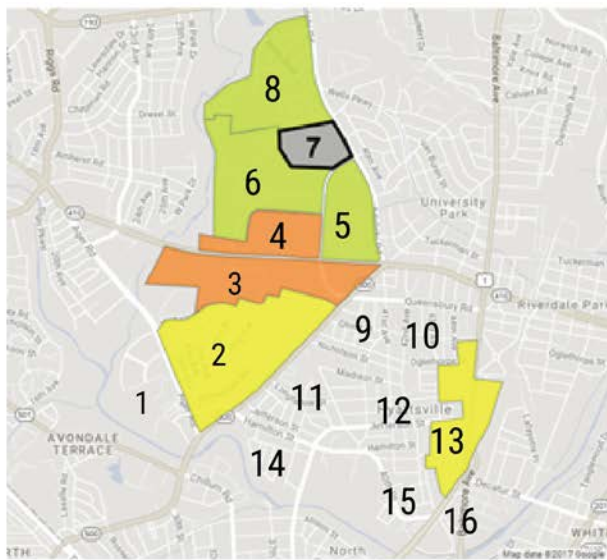
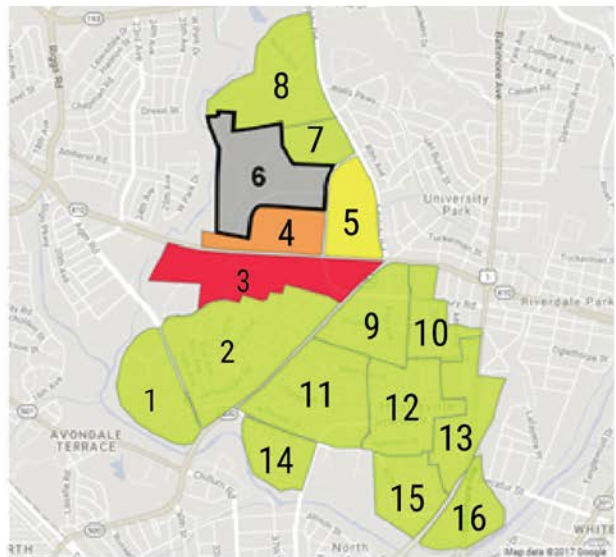
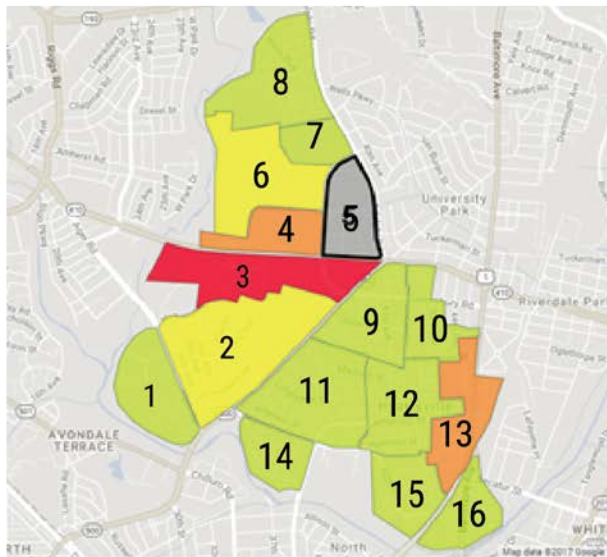
### Local Results:

The following maps show the proportion of trips originating in a defined zone in the City and ending in others. In the maps, the grey areas represent the origin zones and the colored areas show the proportion of trips ending in the other areas. Areas with the highest proportion of trips are noted in red. For instance, the first map indicates that, of the traffic originates in Zone 1 and travels within Hyattsville, the highest volume of trips end in Zone 2.

**Figure 41: Proportion of Trips Originating in a Zone (bold) that Ended in Another Zone**

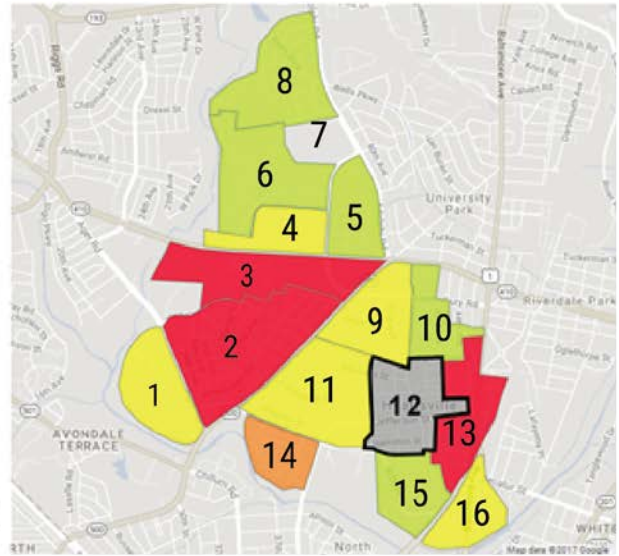
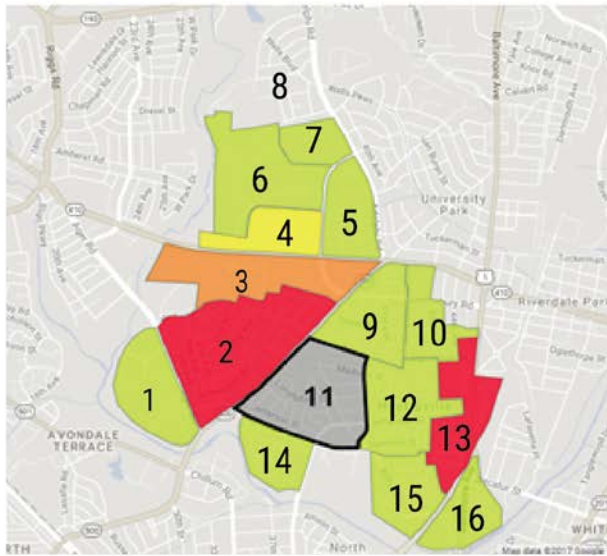
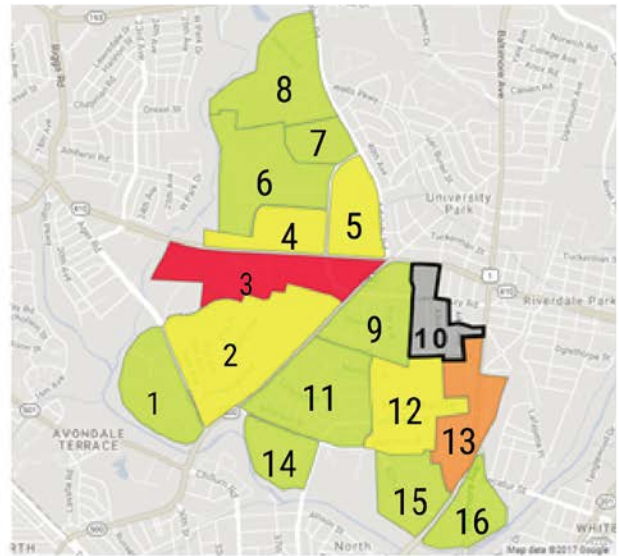
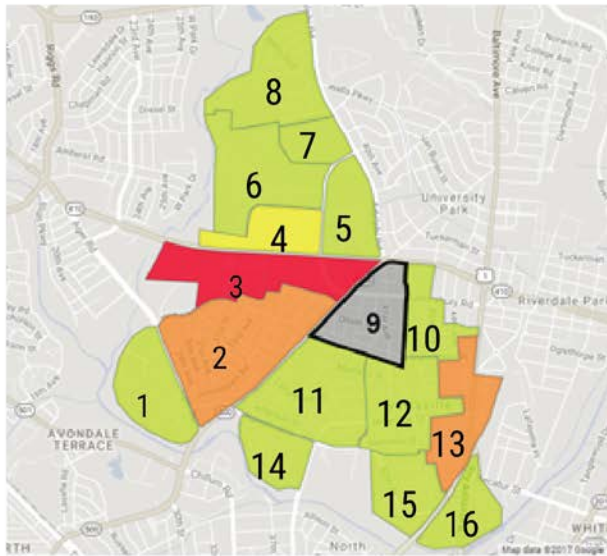


Insufficient Trips  
  Low Volume of Trips  
  Low-Med Volume of Trips  
  Hi-Med Volume of Trips  
  Hi Volume of Trips  
  Origin Zone

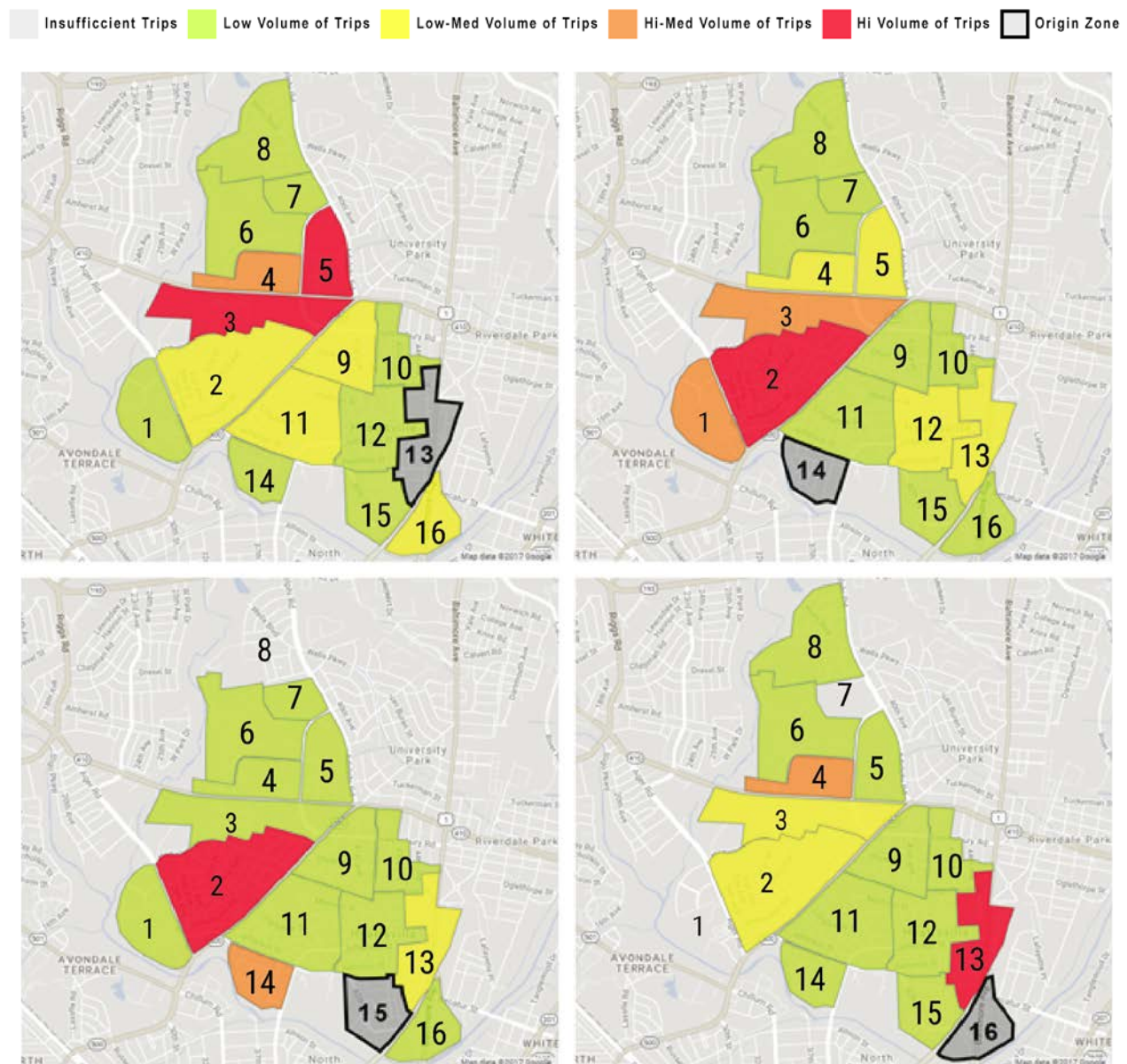




Insufficient Trips
  Low Volume of Trips
  Low-Med Volume of Trips
  Hi-Med Volume of Trips
  Hi Volume of Trips
  Origin Zone







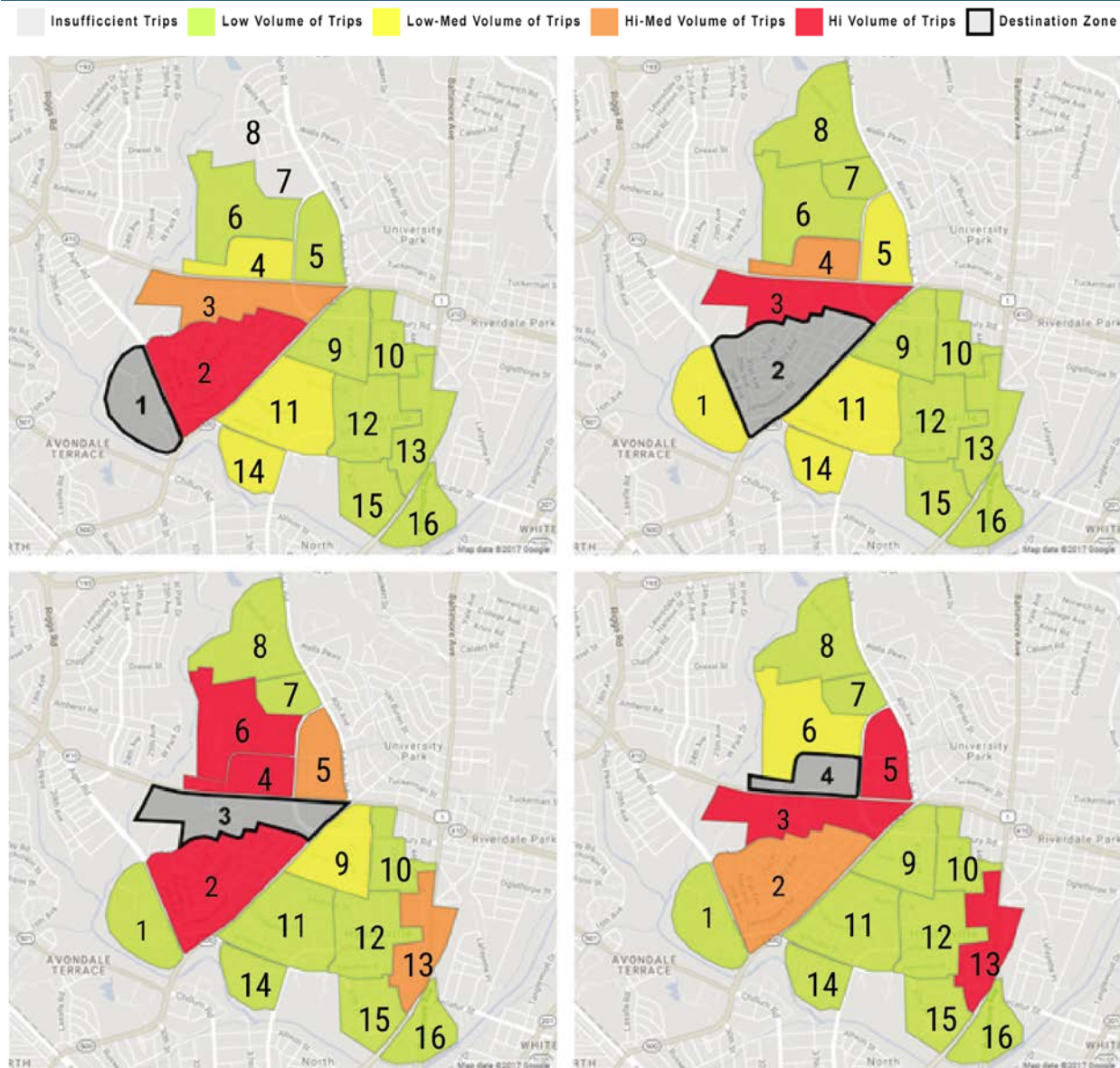
The data shows that a vast number of contiguous zones within the city receive the highest proportion of trips between each other. These are short trips that can potentially be made by walking or biking. The data also indicates that the most common destinations in the City are Zones 2, 3, 4, 5, and 13. These zones include the following local and regional destinations:

- Prince George's Plaza and Hyattsville Metro stations (Zone 1 and 3);
- Downtown Hyattsville/Arts District (Zone 13);
- The Mall at Prince George's (Zone 4)
- University Town Center (Zone 5)

## Destination Maps

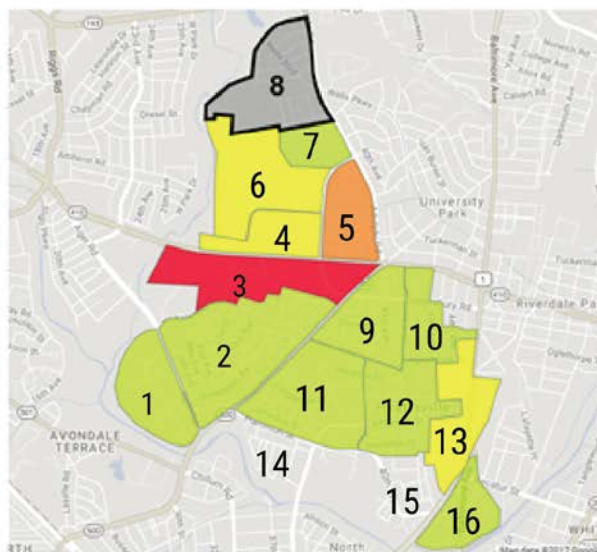
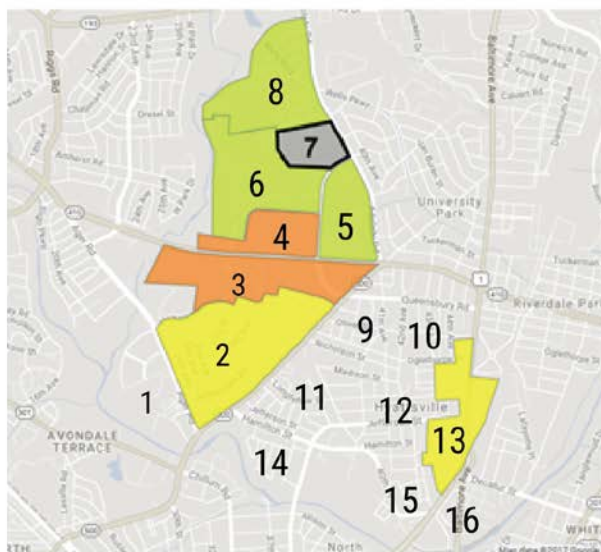
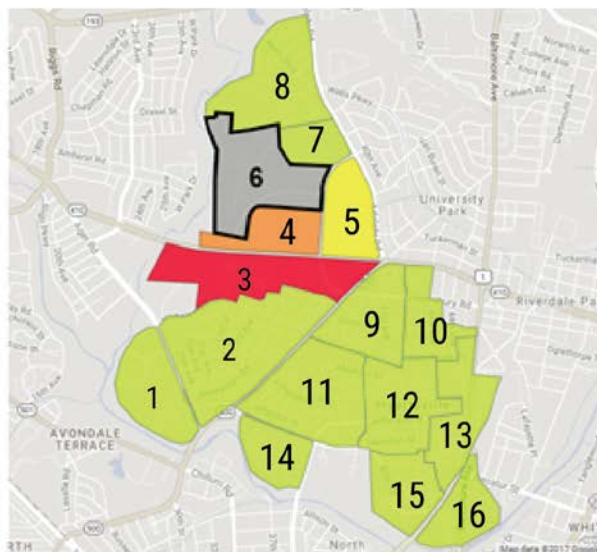
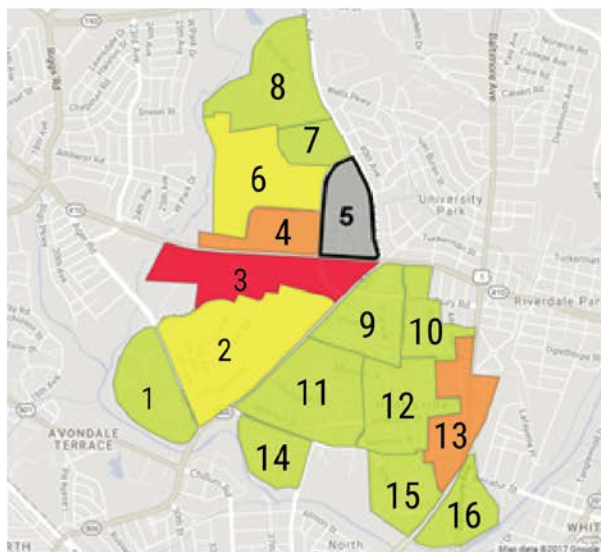
The following maps show the proportion of trips ending in a defined zone in the City and originating in others. In the maps, the grey areas represent the destinations zones and the colored areas show the proportion of trips originating from n the other areas. Areas with the highest proportion of trips are noted in red.

**Figure 42: Proportion of Trips Ending in a Zone (bold) that Originated in Another Zone (colored)**

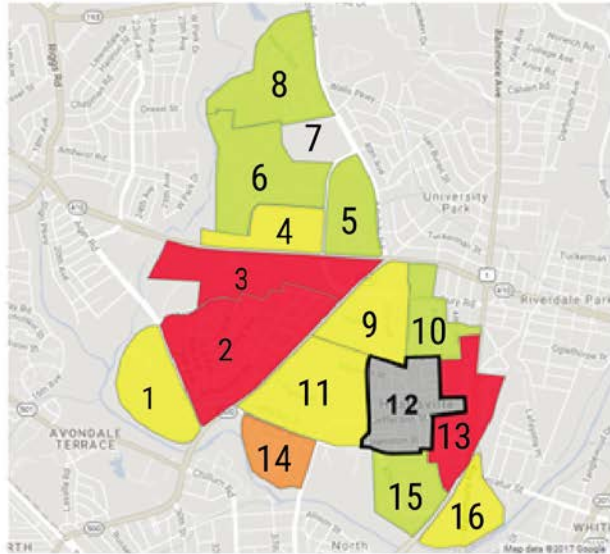
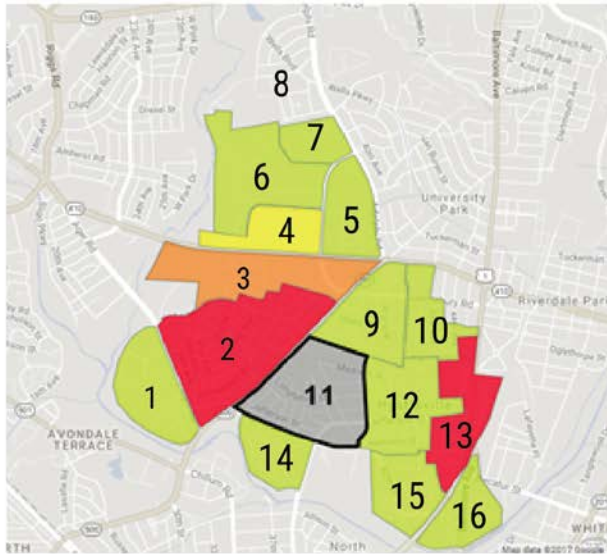
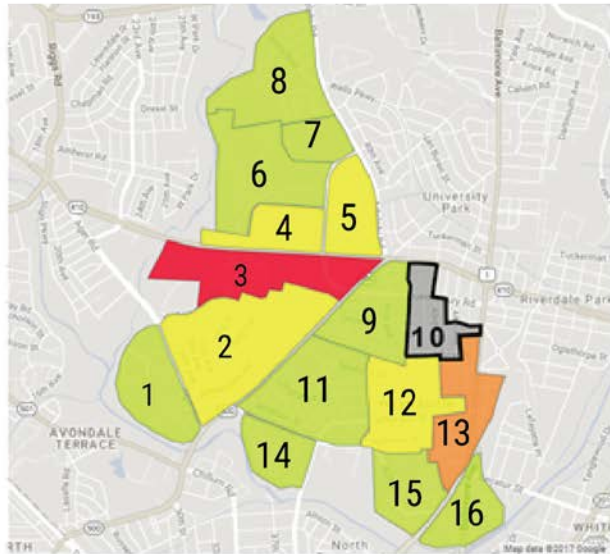
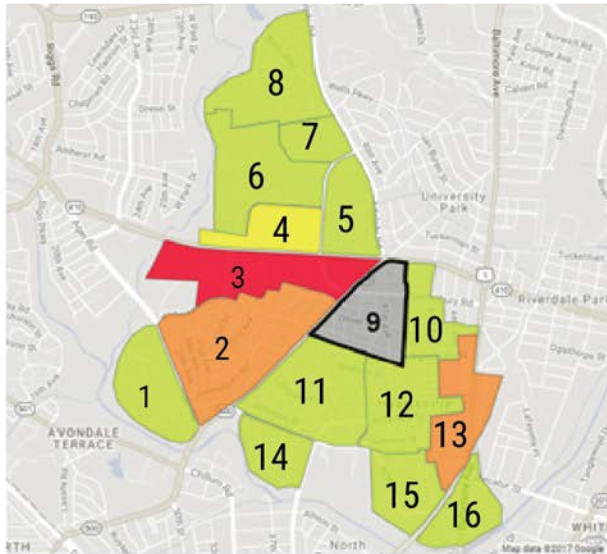




Insufficient Trips  
  Low Volume of Trips  
  Low-Med Volume of Trips  
  Hi-Med Volume of Trips  
  Hi Volume of Trips  
  Destination Zone

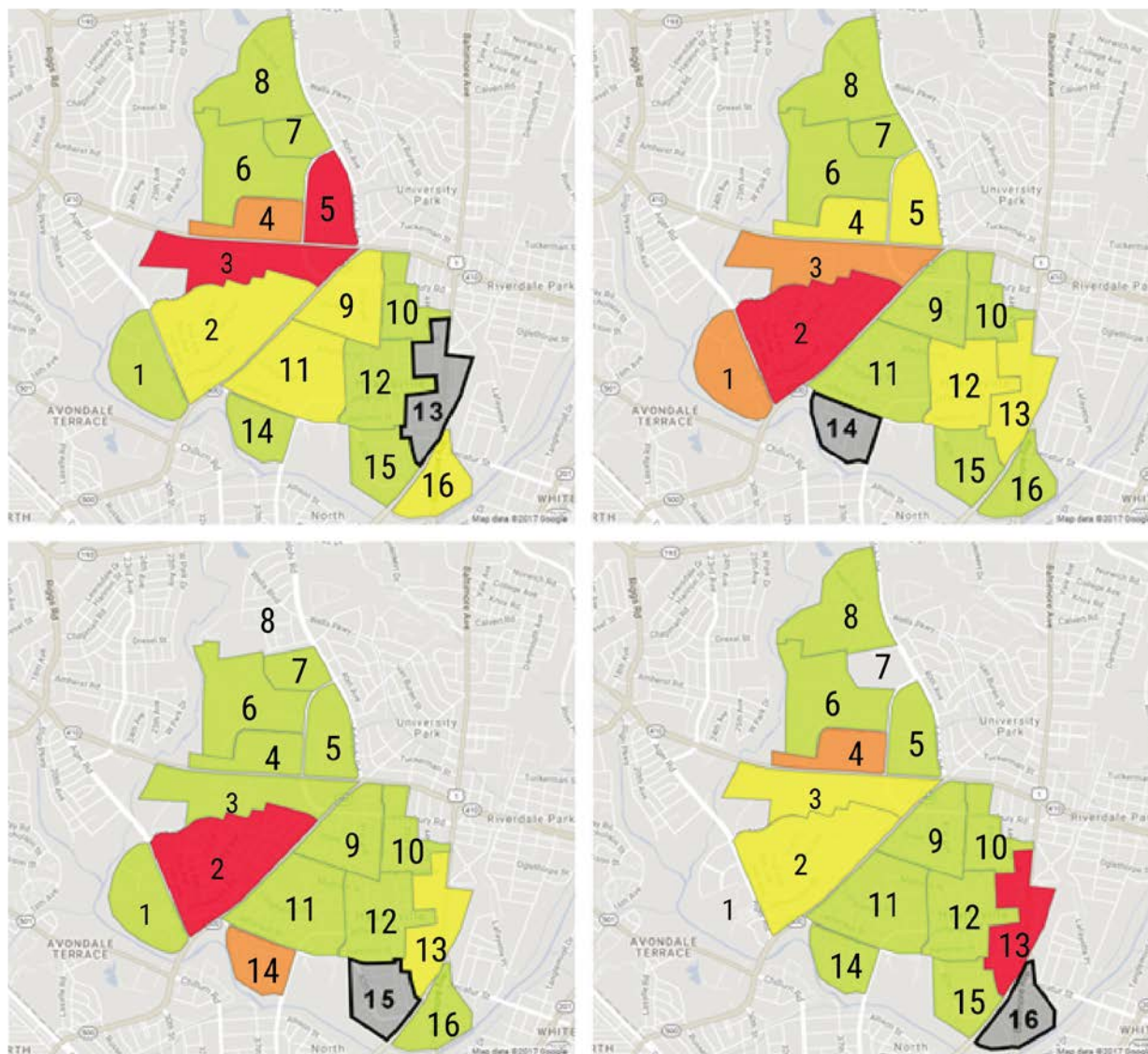


Insufficient Trips
  Low Volume of Trips
  Low-Med Volume of Trips
  Hi-Med Volume of Trips
  Hi Volume of Trips
  Destination Zone





Insufficient Trips
  Low Volume of Trips
  Low-Med Volume of Trips
  Hi-Med Volume of Trips
  Hi Volume of Trips
  Destination Zone



Similar to the origin data, the destination data shows that contiguous zones within the city are often the starting point for trips. Often, destination traffic originates from Zones 2, 3 and 13. Interestingly, these zones are also the most common destinations.



## Local Street Travel Pattern Assessment

The StreetLight data was used to assess the travel pattern of local streets in Hyattsville that were identified by Wikimap survey respondents as being a barrier to travel. The assessment identified the OD zone pairs that contributed the most amount of traffic to the local street segment. The information, in conjunction with other data, will be used to determine potential mitigation measures to improve mobility between the OD zone pair. Among other specific local street segments, the assessment identified Belcrest Road, south of East-West Highway, and Queensbury Road as having the greatest volume of traffic from different zones within the City. The following is a summary of specific corridors:

### Belcrest Road

Belcrest Road, south of the East-West Highway (MD 410), experiences the highest traffic volumes than any other local street from traffic within Hyattsville. Most of the traffic volume originates in Zone 3, with high traffic volume on Belcrest ending in Zone 2 and Zone 13. Zone 2 is located just south of Zone 3 where enhanced bicycle and pedestrian connection can potentially reduce traffic on Belcrest Road. Zone 13 is located along US 1 and would require extended multimodal connection to help reduce traffic on Belcrest Road.

### Hamilton Street

Zone 14 produces high traffic volumes on Hamilton Street. Trips originating in Zone 14 and traveling to Zone 2, or originating in Zone 2 and traveling to Zone 14, produce the highest volumes of traffic on the street. Queens Chapel Road acts as a barrier to bicycling and pedestrian connection between Zone 14 and Zone 2.

### Jefferson Street

Trips originating in Zone 2 and ending in Zone 13, or trips originating in Zone 13 and ending in Zone 11 have a higher traffic volume that uses Jefferson streets, than other origin-destination trips. Hence, potential enhanced multimodal connection between Zone 13 and Zone 11 would likely reduce traffic volume on Jefferson St.

### Nicholson Street - East of Queens Chapel Road

Nicholson Street, east of Queens Chapel Road, has high traffic volume from trips originating in Zone 2. However, most of the traffic that leaves Zone 2 and passes through Queens Chapel Road either ends in Zone 9 or Zone 13.

### Nicholson Street - West of Queens Chapel Road

Nicholson Street, west of Queens Chapel Road, has high traffic volume from trips originating in Zone 2. Vehicles use this segment of Nicholson Street to either travel within Zone 2, or to travel to Zone 3.

### Queensbury Road

Queensbury Road experiences it's highest traffic volumes from trips originating in Zone 3 and ending in Zone 13 and for trips originating in Zone 13 and ending in Zone 4. This data suggests that providing enhanced multimodal connection between Zone 13 and Zone 3 and 4, would likely reduce traffic volume on Queensbury Road.

## **Appendix I-A**

### **School Infrastructure Assessment Reports**

## **Appendix I-B**

### **Existing Traffic Volume Figures**

## **Appendix I-C**

### **Existing Lane Configuration**

**Appendix I-D**  
**Existing LOS by Movement**



## **Appendix I-E**

### **Existing Intersection Operational Results VISTRO HCM Report**

## **Appendix I-F**

### **Existing 95<sup>th</sup>-Pecentile Queue and Storage**

Hyattsville Transportation Plan

Vistro File: K:\...\2037 AM Build.vistro

Scenario: Base Scenario

Report File: K:\...\2037 AM\_Build.pdf

8/1/2018

**Intersection Analysis Summary**

| ID | Intersection Name                        | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
|----|------------------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| 1  | MD 500/Ager Rd                           | Signalized   | HCM 2010        | NEB Left   | 0.892 | 35.1          | D   |
| 2  | MD 500/Hamilton St                       | Signalized   | HCM 2010        | SEB Thru   | 0.844 | 59.2          | E   |
| 3  | MD 500/Nicholson St                      | Signalized   | HCM 2010        | SEB Left   | 0.526 | 9.1           | A   |
| 4  | MD 500/Belcrest Rd/Queensbury Rd         | Signalized   | HCM 2010        | EB Right   | 0.801 | 28.8          | C   |
| 5  | MD 208(Hamilton St)/38th Ave             | Signalized   | HCM 2010        | SWB Right  | 0.861 | 38.7          | D   |
| 6  | US 1/MD 410                              | Signalized   | HCM 2010        | SB Right   | 0.929 | 80.1          | F   |
| 7  | US 1/Queensbury Rd                       | Signalized   | HCM 2010        | WB Left    | 0.532 | 17.7          | B   |
| 8  | US 1/Oglethorpe Rd                       | Signalized   | HCM 2010        | EB Left    | 0.524 | 11.9          | B   |
| 9  | US 1/Madison St                          | Signalized   | HCM 2010        | EB Right   | 0.639 | 16.9          | B   |
| 10 | US 1/Jefferson St                        | Signalized   | HCM 2010        | EB Right   | 0.757 | 19.9          | B   |
| 11 | US 1/Hamilton St (North)                 | Two-way stop | HCM 2010        | WB Right   | 0.003 | 14.1          | B   |
| 12 | US 1/Hamilton St (South)/US 1 Alt        | Signalized   | HCM 2010        | NWB Right  | 0.893 | 58.7          | E   |
| 13 | US 1 Alt/Decatur St                      | Signalized   | HCM 2010        | WB Right   | 0.746 | 44.4          | D   |
| 14 | US 1 Alt/Charles Armentrout St           | Signalized   | HCM 2010        | NB Left    | 0.730 | 32.8          | C   |
| 15 | US 1/Gallatin St                         | Signalized   | HCM 2010        | EB Left    | 0.339 | 3.9           | A   |
| 16 | US 1/Farragut St                         | Signalized   | HCM 2010        | EB Left    | 0.347 | 10.0          | A   |
| 17 | US 1/43rd Avenue                         | Two-way stop | HCM 6th Edition | SEB Left   | 0.047 | 35.6          | E   |
| 18 | US 1/42nd Place/Crittendon St            | Signalized   | HCM 2010        | NEBL2      | 0.879 | 33.6          | C   |
| 19 | US 1/41st Place/Charles Armentrout Drive | Signalized   | HCM 2010        | NEB Left   | 0.946 | 42.9          | D   |
| 20 | MD 410/Toledo Terrace                    | Signalized   | HCM 2010        | NB Left    | 0.612 | 31.8          | C   |
| 21 | MD 410/Editors Park Dr                   | Signalized   | HCM 2010        | NB Right   | 0.418 | 5.2           | A   |
| 22 | MD 410/Prince George's Plaza             | Signalized   | HCM 2010        | NB Right   | 0.388 | 13.3          | B   |
| 23 | MD 410/Belcrest Rd                       | Signalized   | HCM 2010        | EB Left    | 0.686 | 41.4          | D   |
| 24 | MD 410/MD 500/Adelphi Rd                 | Signalized   | HCM 2010        | NB Right   | 0.850 | 46.4          | D   |
| 25 | Ager Rd/23rd Ave                         | Signalized   | HCM 6th Edition | SWB Left   | 0.579 | 35.9          | D   |
| 26 | Ager Rd/Oglethorpe St/School             | Signalized   | HCM 6th Edition | NWB Right  | 0.420 | 39.2          | D   |

|      |                              |              |                 |          |       |      |   |
|------|------------------------------|--------------|-----------------|----------|-------|------|---|
| 27   | Ager Rd/Nicholson St         | Signalized   | HCM 2010        | NEB Left | 0.465 | 16.3 | B |
| 28   | Ager Rd/Hamilton St          | Signalized   | HCM 2010        | EB Left  | 0.841 | 19.7 | B |
| 29   | Toledo Rd/Belcrest Rd        | Signalized   | HCM 2010        | EB Left  | 0.375 | 8.6  | A |
| 30   | Adelphi Rd/Belcrest Rd       | Signalized   | HCM 2010        | SWB Thru | 0.783 | 23.7 | C |
| 31   | Adelphi Rd/Campus Dr         | Signalized   | HCM 2010        | WB Left  | 0.473 | 31.8 | C |
| 32   | Adelphi Rd/Toledo Rd         | Signalized   | HCM 2010        | EB Right | 0.424 | 6.3  | A |
| 33   | Hamilton St/40th Pl/39th Ave | Roundabout   | HCM 2010        | NWB Thru |       | 8.1  | A |
| 4281 | New Intersection             | Two-way stop | HCM 6th Edition | NB Thru  | 0.000 | 12.6 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

### Intersection Level Of Service Report

#### Intersection 1: MD 500/Ager Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 35.1  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.892

#### Intersection Setup

| Name                   | Ager Rd.                                                                          |        | MD 500                                                                             |        | MD 500                                                                              |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Southbound                                                                        |        | Northeastbound                                                                     |        | Southwestbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Right  | Left                                                                               | Thru   | Thru                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1                                                                                  | 0      | 0                                                                                   | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 400.00                                                                             | 100.00 | 100.00                                                                              | 300.00 |
| Speed [mph]            | 35.00                                                                             |        | 40.00                                                                              |        | 40.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | No                                                                                  |        |

#### Volumes

| Name                                    | Ager Rd. |        | MD 500 |        | MD 500 |        |
|-----------------------------------------|----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 0        | 386    | 303    | 827    | 1353   | 12     |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00     | 2.00   | 2.00   | 2.00   | 2.00   | 3.85   |
| Growth Rate                             | 1.00     | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0        | 58     | 17     | 21     | 85     | 0      |
| Diverted Trips [veh/h]                  | 0        | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0        | 444    | 320    | 848    | 1438   | 12     |
| Peak Hour Factor                        | 1.0000   | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0        | 121    | 87     | 230    | 391    | 3      |
| Total Analysis Volume [veh/h]           | 0        | 483    | 348    | 922    | 1563   | 13     |
| Presence of On-Street Parking           | No       | No     | No     | No     | No     | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 9        |        | 0      |        | 0      |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0      |        | 0      |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permissive | Overlap | Protected | Permissive | Split | Split |
|------------------------------|------------|---------|-----------|------------|-------|-------|
| Signal group                 | 0          | 4       | 1         | 0          | 2     | 0     |
| Auxiliary Signal Groups      |            | 1,4     |           |            |       |       |
| Lead / Lag                   | -          | -       | Lead      | -          | -     | -     |
| Minimum Green [s]            | 0          | 5       | 5         | 0          | 20    | 0     |
| Maximum Green [s]            | 0          | 30      | 43        | 0          | 66    | 0     |
| Amber [s]                    | 0.0        | 3.0     | 4.0       | 0.0        | 5.0   | 0.0   |
| All red [s]                  | 0.0        | 1.0     | 1.0       | 0.0        | 1.0   | 0.0   |
| Split [s]                    | 0          | 20      | 45        | 0          | 55    | 0     |
| Vehicle Extension [s]        | 0.0        | 3.0     | 3.0       | 0.0        | 5.0   | 0.0   |
| Walk [s]                     | 0          | 0       | 0         | 0          | 0     | 0     |
| Pedestrian Clearance [s]     | 0          | 0       | 0         | 0          | 0     | 0     |
| Rest In Walk                 |            | No      |           |            | No    |       |
| I1, Start-Up Lost Time [s]   | 0.0        | 2.0     | 2.0       | 0.0        | 2.0   | 0.0   |
| I2, Clearance Lost Time [s]  | 0.0        | 2.0     | 3.0       | 0.0        | 4.0   | 0.0   |
| Minimum Recall               |            | No      | No        |            | No    |       |
| Maximum Recall               |            | No      | No        |            | Yes   |       |
| Pedestrian Recall            |            | No      | No        |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0     | 0.0       | 0.0        | 230.0 | 0.0   |
| Detector Length [ft]         | 0.0        | 30.0    | 30.0      | 0.0        | 6.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00       | 1.00    | 1.00      | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 3.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 47    | 28    | 62    | 62    |
| g / C, Green / Cycle                    | 0.40  | 0.23  | 0.51  | 0.51  |
| (v / s)_i Volume / Saturation Flow Rate | 0.31  | 0.20  | 0.44  | 0.01  |
| s, saturation flow rate [veh/h]         | 1583  | 1774  | 3547  | 1547  |
| c, Capacity [veh/h]                     | 627   | 408   | 1818  | 793   |
| d1, Uniform Delay [s]                   | 31.55 | 44.32 | 25.51 | 14.39 |
| k, delay calibration                    | 0.34  | 0.12  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 6.20  | 5.58  | 5.58  | 0.04  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |       |
|---------------------------------------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.77   | 0.85   | 0.86   | 0.02  |
| d, Delay for Lane Group [s/veh]       | 37.75  | 49.90  | 31.09  | 14.43 |
| Lane Group LOS                        | D      | D      | C      | B     |
| Critical Lane Group                   | Yes    | Yes    | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 12.93  | 10.31  | 19.45  | 0.18  |
| 50th-Percentile Queue Length [ft/ln]  | 323.23 | 257.81 | 486.16 | 4.44  |
| 95th-Percentile Queue Length [veh/ln] | 18.83  | 15.58  | 26.68  | 0.32  |
| 95th-Percentile Queue Length [ft/ln]  | 470.65 | 389.48 | 666.96 | 7.99  |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |      |       |       |
|---------------------------------|-------|-------|-------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 0.00  | 37.75 | 49.90 | 0.00 | 31.09 | 14.43 |
| Movement LOS                    |       | D     | D     |      | C     | B     |
| d_A, Approach Delay [s/veh]     | 37.75 |       | 49.90 |      | 30.95 |       |
| Approach LOS                    | D     |       | D     |      | C     |       |
| d_I, Intersection Delay [s/veh] | 35.06 |       |       |      |       |       |
| Intersection LOS                | D     |       |       |      |       |       |
| Intersection V/C                | 0.892 |       |       |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: MD 500/Hamilton St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 59.2  
 Level Of Service: E  
 Volume to Capacity (v/c): 0.844

#### Intersection Setup

| Name                   | MD 500                                                                            |       |       |       | MD 500                                                                            |        |        | Hamilton St                                                                         |        |        | Hamilton St                                                                         |        |       |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|-------|
| Approach               | Northeastbound                                                                    |       |       |       | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |       |
| Lane Configuration     |  |       |       |       |  |        |        |  |        |        |  |        |       |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00 |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 1     | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1     |
| Pocket Length [ft]     | 200.0                                                                             | 100.0 | 100.0 | 200.0 | 220.00                                                                            | 100.00 | 200.00 | 200.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 50.00 |
| Speed [mph]            | 40.00                                                                             |       |       |       | 40.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |       |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |       |
| Crosswalk              | Yes                                                                               |       |       |       | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |       |

#### Volumes

| Name                                    | MD 500 |       |       |       | MD 500 |        |        | Hamilton St |        |        | Hamilton St |        |        |
|-----------------------------------------|--------|-------|-------|-------|--------|--------|--------|-------------|--------|--------|-------------|--------|--------|
| Base Volume Input [veh/h]               | 2      | 23    | 608   | 128   | 95     | 949    | 89     | 302         | 420    | 89     | 110         | 378    | 31     |
| Base Volume Adjustment Factor           | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 0.00  | 2.00  | 2.63  | 2.00   | 2.00   | 2.63   | 2.27        | 2.11   | 2.00   | 2.00        | 2.27   | 3.85   |
| Growth Rate                             | 1.00   | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0     | 21    | 0     | 22     | 85     | 3      | 0           | 10     | 5      | 12          | 35     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Total Hourly Volume [veh/h]             | 2      | 23    | 629   | 128   | 117    | 1034   | 92     | 302         | 430    | 94     | 122         | 413    | 31     |
| Peak Hour Factor                        | 0.920  | 0.920 | 0.920 | 0.920 | 0.9200 | 0.9200 | 0.9200 | 0.9200      | 0.9200 | 0.9200 | 0.9200      | 0.9200 | 0.9200 |
| Other Adjustment Factor                 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1      | 6     | 171   | 35    | 32     | 281    | 25     | 82          | 117    | 26     | 33          | 112    | 8      |
| Total Analysis Volume [veh/h]           | 2      | 25    | 684   | 139   | 127    | 1124   | 100    | 328         | 467    | 102    | 133         | 449    | 34     |
| Presence of On-Street Parking           | No     |       |       | No    | No     |        | No     | No          |        | No     | No          |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |       |       |       | 0      |        |        | 0           |        |        | 0           |        |        |
| Bicycle Volume [bicycles/h]             | 0      |       |       |       | 0      |        |        | 0           |        |        | 0           |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 16.00                           |

**Phasing & Timing**

| Control Type                 | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 1     | 1     | 6     | 6     | 5        | 2       | 2       | 3        | 8       | 8       | 7        | 4       | 4       |
| Auxiliary Signal Groups      |       |       |       |       |          |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lead  | Lead  | -     | -     | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 20    | 20    | 5        | 20      | 20      | 5        | 5       | 5       | 5        | 5       | 5       |
| Maximum Green [s]            | 13    | 13    | 42    | 42    | 30       | 42      | 42      | 19       | 25      | 25      | 19       | 25      | 25      |
| Amber [s]                    | 4.0   | 4.0   | 5.0   | 5.0   | 4.0      | 5.0     | 5.0     | 4.0      | 4.0     | 4.0     | 4.0      | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 1.0   | 1.0      | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     |
| Split [s]                    | 18    | 18    | 48    | 48    | 18       | 48      | 48      | 24       | 30      | 30      | 24       | 30      | 30      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 5.0   | 5.0   | 3.0      | 5.0     | 5.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       |       | No    |       |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 4.0   | 4.0   | 3.0      | 4.0     | 4.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Minimum Recall               |       | No    | No    |       | No       | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    | Yes   |       | No       | Yes     |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |       | No    | No    |       | No       | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 5.0   | 5.0   | 5.0      | 5.0     | 5.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | L     | C      |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120    |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 5.00  | 5.00  | 5.00  | 5.00   |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   |
| l2, Clearance Lost Time [s]             | 0.00  | 4.00  | 4.00  | 0.00  | 4.00  | 4.00  | 0.00  | 3.00  | 0.00  | 3.00   |
| g_i, Effective Green Time [s]           | 60    | 48    | 48    | 60    | 52    | 52    | 49    | 36    | 49    | 26     |
| g / C, Green / Cycle                    | 0.50  | 0.40  | 0.40  | 0.50  | 0.43  | 0.43  | 0.41  | 0.30  | 0.41  | 0.21   |
| (v / s)_i Volume / Saturation Flow Rate | 0.04  | 0.19  | 0.09  | 0.14  | 0.32  | 0.06  | 0.26  | 0.32  | 0.13  | 0.26   |
| s, saturation flow rate [veh/h]         | 639   | 3547  | 1574  | 922   | 3547  | 1574  | 1284  | 1804  | 1049  | 1835   |
| c, Capacity [veh/h]                     | 277   | 1428  | 634   | 443   | 1543  | 685   | 420   | 539   | 267   | 389    |
| d1, Uniform Delay [s]                   | 19.50 | 26.54 | 23.49 | 17.56 | 28.05 | 20.46 | 29.03 | 42.09 | 28.70 | 47.31  |
| k, delay calibration                    | 0.11  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.48  | 0.13  | 0.50   |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   |
| d2, Incremental Delay [s]               | 0.15  | 1.15  | 0.80  | 1.62  | 3.05  | 0.45  | 13.39 | 53.46 | 1.78  | 129.02 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   |

**Lane Group Results**

|                                       |       |        |        |       |        |       |        |        |        |        |
|---------------------------------------|-------|--------|--------|-------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.10  | 0.48   | 0.22   | 0.29  | 0.73   | 0.15  | 0.78   | 1.06   | 0.50   | 1.24   |
| d, Delay for Lane Group [s/veh]       | 19.66 | 27.69  | 24.29  | 19.18 | 31.11  | 20.91 | 42.43  | 95.55  | 30.48  | 176.33 |
| Lane Group LOS                        | B     | C      | C      | B     | C      | C     | D      | F      | C      | F      |
| Critical Lane Group                   | Yes   | No     | No     | No    | Yes    | No    | Yes    | No     | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 0.38  | 7.26   | 2.67   | 2.02  | 13.42  | 1.74  | 8.27   | 23.56  | 2.53   | 25.35  |
| 50th-Percentile Queue Length [ft/ln]  | 9.40  | 181.40 | 66.72  | 50.46 | 335.44 | 43.55 | 206.76 | 589.01 | 63.18  | 633.80 |
| 95th-Percentile Queue Length [veh/ln] | 0.68  | 11.67  | 4.80   | 3.63  | 19.42  | 3.14  | 12.99  | 32.65  | 4.55   | 37.56  |
| 95th-Percentile Queue Length [ft/ln]  | 16.92 | 291.85 | 120.10 | 90.82 | 485.62 | 78.39 | 324.68 | 816.24 | 113.72 | 938.88 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |        |        |        |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| d_M, Delay for Movement [s/veh] | 19.66 | 19.66 | 27.69 | 24.29 | 19.18 | 31.11 | 20.91 | 42.43 | 95.55 | 95.55 | 30.48  | 176.33 | 176.33 |
| Movement LOS                    | B     | B     | C     | C     | B     | C     | C     | D     | F     | F     | C      | F      | F      |
| d_A, Approach Delay [s/veh]     | 26.88 |       |       |       | 29.23 |       |       | 76.13 |       |       | 144.84 |        |        |
| Approach LOS                    | C     |       |       |       | C     |       |       | E     |       |       | F      |        |        |
| d_I, Intersection Delay [s/veh] | 59.19 |       |       |       |       |       |       |       |       |       |        |        |        |
| Intersection LOS                | E     |       |       |       |       |       |       |       |       |       |        |        |        |
| Intersection V/C                | 0.844 |       |       |       |       |       |       |       |       |       |        |        |        |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: MD 500/Nicholson St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 9.1  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.526

#### Intersection Setup

| Name                   | Nicholson St                                                                      |        |        | MD 500                                                                            |        |        | MD 500                                                                              |       |       |       | Nicholson St                                                                        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Westbound                                                                         |        |        | Northeastbound                                                                    |        |        | Southwestbound                                                                      |       |       |       | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |       |       |       |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0     | 0     | 0     | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 150.00                                                                            | 100.00 | 100.00 | 150.0                                                                               | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |       |       |       | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |       |       |       | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |       |       |       | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Nicholson St |        |        | MD 500 |        |        | MD 500 |       |       |       | Nicholson St |        |        |
|-----------------------------------------|--------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 15           | 59     | 26     | 48     | 912    | 10     | 1      | 11    | 1111  | 84    | 100          | 10     | 18     |
| Base Volume Adjustment Factor           | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00         | 0.00   | 0.00   | 0.00   | 2.00   | 0.00   | 0.00   | 0.00  | 2.00  | 0.00  | 2.27         | 0.00   | 0.00   |
| Growth Rate                             | 1.00         | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00         | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0            | 0      | 0      | 0      | 38     | 0      | 0      | 0     | 110   | 0     | 0            | 0      | 0      |
| Diverted Trips [veh/h]                  | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 15           | 59     | 26     | 48     | 950    | 10     | 1      | 11    | 1221  | 84    | 100          | 10     | 18     |
| Peak Hour Factor                        | 0.9000       | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.900  | 0.900 | 0.900 | 0.900 | 0.9000       | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4            | 16     | 7      | 13     | 264    | 3      | 0      | 3     | 339   | 23    | 28           | 3      | 5      |
| Total Analysis Volume [veh/h]           | 17           | 66     | 29     | 53     | 1056   | 11     | 1      | 12    | 1357  | 93    | 111          | 11     | 20     |
| Presence of On-Street Parking           | No           |        | No     | No     |        | No     | No     |       |       | No    | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0            |        |        | 0      |        |        | 0      |       |       |       | 0            |        |        |
| Bicycle Volume [bicycles/h]             | 0            |        |        | 0      |        |        | 0      |       |       |       | 0            |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permi | Prote | Permi | Permi | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|----------|---------|---------|-------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 5        | 2       | 0       | 0     | 1     | 6     | 0     | 0       | 8       | 0       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |       |       |       |       |         |         |         |
| Lead / Lag                   | -       | -       | -       | Lead     | -       | -       | -     | Lead  | -     | -     | -       | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 5        | 5       | 0       | 0     | 5     | 5     | 0     | 0       | 5       | 0       |
| Maximum Green [s]            | 0       | 30      | 0       | 30       | 30      | 0       | 0     | 30    | 30    | 0     | 0       | 30      | 0       |
| Amber [s]                    | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 0.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     | 0.0   | 1.0   | 1.0   | 0.0   | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 0       | 25      | 0       | 10       | 85      | 0       | 0     | 10    | 85    | 0     | 0       | 25      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 0.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0       | 5       | 0       | 0        | 5       | 0       | 0     | 0     | 5     | 0     | 0       | 5       | 0       |
| Pedestrian Clearance [s]     | 0       | 10      | 0       | 0        | 10      | 0       | 0     | 0     | 10    | 0     | 0       | 10      | 0       |
| Rest In Walk                 |         | No      |         |          | No      |         |       |       | No    |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 0.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 0.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     |
| Minimum Recall               |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Maximum Recall               |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Pedestrian Recall            |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L    | C    | C    | L    | C    | C    | C     |
|-----------------------------------------|-------|------|------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 38    | 38   | 38   | 38   | 38   | 38   | 38   | 38    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00  |
| g_i, Effective Green Time [s]           | 5     | 25   | 20   | 20   | 25   | 19   | 19   | 5     |
| g / C, Green / Cycle                    | 0.14  | 0.65 | 0.53 | 0.53 | 0.65 | 0.49 | 0.49 | 0.14  |
| (v / s)_i Volume / Saturation Flow Rate | 0.06  | 0.09 | 0.29 | 0.29 | 0.02 | 0.39 | 0.39 | 0.12  |
| s, saturation flow rate [veh/h]         | 1836  | 614  | 1863 | 1856 | 673  | 1863 | 1821 | 1203  |
| c, Capacity [veh/h]                     | 367   | 557  | 987  | 984  | 620  | 913  | 893  | 337   |
| d1, Uniform Delay [s]                   | 15.15 | 4.86 | 5.98 | 5.98 | 3.03 | 8.26 | 8.29 | 16.20 |
| k, delay calibration                    | 0.11  | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 0.46  | 0.07 | 0.46 | 0.47 | 0.01 | 1.68 | 1.77 | 0.84  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |      |       |       |      |        |        |       |
|---------------------------------------|-------|------|-------|-------|------|--------|--------|-------|
| X, volume / capacity                  | 0.30  | 0.10 | 0.54  | 0.54  | 0.02 | 0.80   | 0.81   | 0.42  |
| d, Delay for Lane Group [s/veh]       | 15.61 | 4.93 | 6.44  | 6.44  | 3.04 | 9.94   | 10.05  | 17.04 |
| Lane Group LOS                        | B     | A    | A     | A     | A    | A      | B      | B     |
| Critical Lane Group                   | No    | Yes  | No    | No    | No   | No     | Yes    | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 0.80  | 0.06 | 1.73  | 1.73  | 0.01 | 3.52   | 3.49   | 1.10  |
| 50th-Percentile Queue Length [ft/ln]  | 19.94 | 1.44 | 43.36 | 43.22 | 0.34 | 87.95  | 87.23  | 27.43 |
| 95th-Percentile Queue Length [veh/ln] | 1.44  | 0.10 | 3.12  | 3.11  | 0.02 | 6.33   | 6.28   | 1.97  |
| 95th-Percentile Queue Length [ft/ln]  | 35.89 | 2.60 | 78.06 | 77.80 | 0.60 | 158.31 | 157.02 | 49.37 |



**Movement, Approach, & Intersection Results**

|                                 |       |       |       |      |      |      |      |      |      |       |       |       |       |
|---------------------------------|-------|-------|-------|------|------|------|------|------|------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 15.61 | 15.61 | 15.61 | 4.93 | 6.44 | 6.44 | 3.04 | 3.04 | 9.99 | 10.05 | 17.04 | 17.04 | 17.04 |
| Movement LOS                    | B     | B     | B     | A    | A    | A    | A    | A    | A    | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 15.61 |       |       | 6.37 |      |      | 9.93 |      |      | 17.04 |       |       |       |
| Approach LOS                    | B     |       |       | A    |      |      | A    |      |      | B     |       |       |       |
| d_I, Intersection Delay [s/veh] | 9.11  |       |       |      |      |      |      |      |      |       |       |       |       |
| Intersection LOS                | A     |       |       |      |      |      |      |      |      |       |       |       |       |
| Intersection V/C                | 0.526 |       |       |      |      |      |      |      |      |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 4: MD 500/Belcrest Rd/Queensbury Rd

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 28.8  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.801 |

#### Intersection Setup

| Name                   | Belcrest Road                                                                     |        |        | Queensbury Road                                                                   |        |        | MD 500                                                                              |        |        | MD 500                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Eastbound                                                                         |        |        | Westbound                                                                         |        |        | Northeastbound                                                                      |        |        | Southwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 150.00 | 100.00                                                                            | 100.00 | 100.00 | 375.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Road |        |        | Queensbury Road |        |        | MD 500 |        |        | MD 500 |        |        |
|-----------------------------------------|---------------|--------|--------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 61            | 121    | 416    | 38              | 184    | 35     | 349    | 697    | 39     | 27     | 738    | 64     |
| Base Volume Adjustment Factor           | 1.0000        | 1.0000 | 1.0000 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85          | 2.38   | 2.21   | 3.85            | 2.38   | 3.85   | 2.21   | 2.08   | 2.78   | 3.70   | 1.97   | 0.00   |
| Growth Rate                             | 1.00          | 1.00   | 1.00   | 1.00            | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0             | 0      | 107    | 0               | 0      | 0      | 18     | 20     | 0      | 0      | 3      | 0      |
| Diverted Trips [veh/h]                  | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 61            | 121    | 523    | 38              | 184    | 35     | 367    | 717    | 39     | 27     | 741    | 64     |
| Peak Hour Factor                        | 0.9000        | 0.9000 | 0.9000 | 0.9000          | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000        | 1.0000 | 1.0000 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 17            | 34     | 145    | 11              | 51     | 10     | 102    | 199    | 11     | 8      | 206    | 18     |
| Total Analysis Volume [veh/h]           | 68            | 134    | 581    | 42              | 204    | 39     | 408    | 797    | 43     | 30     | 823    | 71     |
| Presence of On-Street Parking           | No            |        | No     | No              |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 6             |        |        | 18              |        |        | 1      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0             |        |        | 0               |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 37.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 4       | 4       | 0       | 8       | 8       | 8       | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 0       | 20      | 20      | 20      | 5        | 20      | 20      | 10       | 20      | 20      |
| Maximum Green [s]            | 40      | 40      | 0       | 40      | 40      | 40      | 40       | 53      | 53      | 40       | 53      | 53      |
| Amber [s]                    | 4.0     | 4.0     | 0.0     | 4.0     | 4.0     | 4.0     | 4.0      | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     |
| All red [s]                  | 1.0     | 1.0     | 0.0     | 1.0     | 1.0     | 1.0     | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 2.0     |
| Split [s]                    | 45      | 45      | 0       | 45      | 45      | 45      | 45       | 60      | 60      | 45       | 60      | 60      |
| Vehicle Extension [s]        | 6.0     | 6.0     | 0.0     | 4.0     | 4.0     | 4.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0     | 3.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Minimum Recall               |         | Yes     |         |         | Yes     |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 30.0    | 30.0    | 30.0    | 0.0      | 0.0     | 0.0     | 30.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | R     | C     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 89    | 89    | 89    | 89    | 89    | 89    | 89    | 89    | 89    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 3.00  | 0.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 37    | 37    | 37    | 40    | 30    | 30    | 40    | 26    | 26    |
| g / C, Green / Cycle                    | 0.41  | 0.41  | 0.41  | 0.45  | 0.34  | 0.34  | 0.45  | 0.29  | 0.29  |
| (v / s)_i Volume / Saturation Flow Rate | 0.15  | 0.37  | 0.17  | 0.21  | 0.23  | 0.23  | 0.03  | 0.24  | 0.24  |
| s, saturation flow rate [veh/h]         | 1369  | 1580  | 1672  | 1908  | 1861  | 1828  | 867   | 1863  | 1812  |
| c, Capacity [veh/h]                     | 617   | 650   | 734   | 750   | 631   | 620   | 389   | 537   | 523   |
| d1, Uniform Delay [s]                   | 17.75 | 24.48 | 18.38 | 18.51 | 25.26 | 25.27 | 15.30 | 29.89 | 29.89 |
| k, delay calibration                    | 0.39  | 0.45  | 0.15  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.11  | 15.78 | 0.48  | 0.62  | 1.25  | 1.27  | 0.08  | 3.70  | 3.81  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |        |       |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.33   | 0.89   | 0.39   | 0.54   | 0.67   | 0.67   | 0.08  | 0.84   | 0.84   |
| d, Delay for Lane Group [s/veh]       | 18.86  | 40.26  | 18.86  | 19.13  | 26.50  | 26.54  | 15.39 | 33.60  | 33.70  |
| Lane Group LOS                        | B      | D      | B      | B      | C      | C      | B     | C      | C      |
| Critical Lane Group                   | No     | Yes    | No     | Yes    | No     | No     | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 2.93   | 13.59  | 4.05   | 2.52   | 7.61   | 7.49   | 0.31  | 8.97   | 8.74   |
| 50th-Percentile Queue Length [ft/ln]  | 73.25  | 339.79 | 101.29 | 63.12  | 190.28 | 187.33 | 7.82  | 224.35 | 218.54 |
| 95th-Percentile Queue Length [veh/ln] | 5.27   | 19.64  | 7.29   | 4.54   | 12.14  | 11.98  | 0.56  | 13.89  | 13.59  |
| 95th-Percentile Queue Length [ft/ln]  | 131.86 | 490.95 | 182.32 | 113.62 | 303.39 | 299.56 | 14.07 | 347.18 | 339.76 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 18.86 | 18.86 | 40.26 | 18.86 | 18.86 | 18.86 | 19.13 | 26.52 | 26.54 | 15.39 | 33.64 | 33.70 |
| Movement LOS                    | B     | B     | D     | B     | B     | B     | B     | C     | C     | B     | C     | C     |
| d_A, Approach Delay [s/veh]     | 34.74 |       |       | 18.86 |       |       | 24.11 |       |       | 33.05 |       |       |
| Approach LOS                    | C     |       |       | B     |       |       | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 28.77 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.801 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 5: MD 208(Hamilton St)/38th Ave

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 38.7  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.861

#### Intersection Setup

| Name                   |                                                                                   |        |        | Hamilton St                                                                       |        |        | 38th Ave                                                                            |        |        | Hamilton St                                                                         |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Westbound                                                                         |        |        | Southwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 125.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 35.00                                                                             |        |        | 30.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Hamilton St |        |        | 38th Ave |        |        | Hamilton St |        |        |
|-----------------------------------------|--------|--------|--------|-------------|--------|--------|----------|--------|--------|-------------|--------|--------|
| Base Volume Input [veh/h]               | 167    | 61     | 23     | 46          | 355    | 11     | 23       | 118    | 269    | 96          | 335    | 158    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.27   | 3.33   | 0.00   | 3.70        | 2.00   | 0.00   | 0.00     | 2.22   | 1.89   | 1.69        | 1.88   | 1.65   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Site-Generated Trips [veh/h]            | 12     | 0      | 0      | 0           | 3      | 0      | 0        | 0      | 0      | 0           | 12     | 45     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Total Hourly Volume [veh/h]             | 179    | 61     | 23     | 46          | 358    | 11     | 23       | 118    | 269    | 96          | 347    | 203    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 50     | 17     | 6      | 13          | 99     | 3      | 6        | 33     | 75     | 27          | 96     | 56     |
| Total Analysis Volume [veh/h]           | 199    | 68     | 26     | 51          | 398    | 12     | 26       | 131    | 299    | 107         | 386    | 226    |
| Presence of On-Street Parking           | No     |        | No     | No          |        | No     | No       |        | No     | No          |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Pedestrian Volume [ped/h]               | 5      |        |        | 4           |        |        | 5        |        |        | 6           |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0           |        |        | 0        |        |        | 0           |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 90                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Semi-actuated                |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 2       | 8       | 8       | 8       | 6       | 6       | 6       | 4       | 4       | 4       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 20      | 20      | 20      | 15      | 15      | 15      | 20      | 20      | 20      |
| Maximum Green [s]            | 15       | 45      | 45      | 35      | 35      | 35      | 20      | 20      | 20      | 35      | 35      | 35      |
| Amber [s]                    | 4.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0      | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 25       | 50      | 50      | 40      | 40      | 40      | 25      | 25      | 25      | 40      | 40      | 40      |
| Vehicle Extension [s]        | 3.0      | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               | Yes      | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | Yes      | Yes     |         |         | Yes     |         |         | Yes     |         |         | Yes     |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0     | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L     | C     | C     | L     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 2.00  | 0.00  | 2.00  | 2.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 45    | 35    | 35    | 25    | 35    | 35    |
| g / C, Green / Cycle                    | 0.50  | 0.39  | 0.39  | 0.28  | 0.39  | 0.39  |
| (v / s)_i Volume / Saturation Flow Rate | 0.31  | 0.06  | 0.22  | 0.28  | 0.11  | 0.35  |
| s, saturation flow rate [veh/h]         | 959   | 793   | 1853  | 1639  | 973   | 1746  |
| c, Capacity [veh/h]                     | 585   | 111   | 721   | 495   | 268   | 679   |
| d1, Uniform Delay [s]                   | 13.51 | 43.90 | 21.58 | 32.61 | 32.92 | 25.87 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 3.04  | 12.96 | 3.24  | 25.06 | 4.40  | 17.38 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |       |        |        |        |        |
|---------------------------------------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.50   | 0.46  | 0.57   | 0.92   | 0.40   | 0.90   |
| d, Delay for Lane Group [s/veh]       | 16.55  | 56.86 | 24.83  | 57.67  | 37.32  | 43.25  |
| Lane Group LOS                        | B      | E     | C      | E      | D      | D      |
| Critical Lane Group                   | Yes    | No    | No     | Yes    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 3.88   | 1.52  | 7.06   | 13.03  | 2.38   | 14.74  |
| 50th-Percentile Queue Length [ft/ln]  | 96.94  | 37.93 | 176.39 | 325.84 | 59.46  | 368.54 |
| 95th-Percentile Queue Length [veh/ln] | 6.98   | 2.73  | 11.41  | 18.95  | 4.28   | 21.04  |
| 95th-Percentile Queue Length [ft/ln]  | 174.49 | 68.28 | 285.29 | 473.86 | 107.03 | 525.96 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 16.55 | 16.55 | 16.55 | 56.86 | 24.83 | 24.83 | 57.67 | 57.67 | 57.67 | 37.32 | 43.25 | 43.25 |
| Movement LOS                    | B     | B     | B     | E     | C     | C     | E     | E     | E     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 16.55 |       |       | 28.37 |       |       | 57.67 |       |       | 42.37 |       |       |
| Approach LOS                    | B     |       |       | C     |       |       | E     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 38.72 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.861 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 6: US 1/MD 410

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 80.1  
 Level Of Service: F  
 Volume to Capacity (v/c): 0.929

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Westbound                                                                           |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 2                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 200.00                                                                            | 100.00 | 100.00 | 225.00                                                                            | 100.00 | 100.00 | 700.00                                                                              | 100.00 | 450.00 | 600.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 45.00                                                                             |        |        | 40.00                                                                               |        |        | 50.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 426    | 527    | 53     | 168    | 704    | 122    | 292    | 1751   | 147    | 179    | 948    | 284    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.15   | 2.00   | 2.38   | 2.07   | 2.00   | 2.00   | 2.00   | 2.03   | 1.67   | 2.00   | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 426    | 527    | 53     | 168    | 704    | 122    | 292    | 1751   | 147    | 179    | 948    | 284    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 118    | 146    | 15     | 47     | 196    | 34     | 81     | 486    | 41     | 50     | 263    | 79     |
| Total Analysis Volume [veh/h]           | 473    | 586    | 59     | 187    | 782    | 136    | 324    | 1946   | 163    | 199    | 1053   | 316    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 6      |        |        | 3      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 180                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 1        | 6       | 6       | 5        | 2       | 0       | 3        | 8       | 8       | 7        | 4       | 4       |
| Auxiliary Signal Groups      |          |         |         |          |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 5        | 25      | 0       | 5        | 25      | 25      | 5        | 15      | 15      |
| Maximum Green [s]            | 25       | 42      | 42      | 25       | 42      | 0       | 25       | 66      | 66      | 25       | 66      | 66      |
| Amber [s]                    | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 0.0     | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 0.0     | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 2.0     |
| Split [s]                    | 30       | 48      | 48      | 30       | 48      | 0       | 30       | 72      | 72      | 30       | 72      | 72      |
| Vehicle Extension [s]        | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 0.0     | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Walk [s]                     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 4.5     | 4.5     | 3.0      | 4.5     | 0.0     | 3.0      | 4.5     | 4.5     | 3.0      | 4.5     | 4.5     |
| Minimum Recall               | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               | No       | Yes     |         | No       | Yes     |         | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 5.0     | 5.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | L     | C     | C     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   |
| L, Total Lost Time per Cycle [s]        | 6.50  | 6.50  | 6.50  | 6.50  | 6.50  | 6.50  | 5.00  | 6.50  | 6.50  | 5.00  | 6.50  | 6.50  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 4.50  | 4.50  | 0.00  | 4.50  | 4.50  | 3.00  | 4.50  | 4.50  | 3.00  | 4.50  | 4.50  |
| g_i, Effective Green Time [s]           | 72    | 51    | 51    | 72    | 45    | 45    | 19    | 68    | 68    | 22    | 71    | 71    |
| g / C, Green / Cycle                    | 0.40  | 0.28  | 0.28  | 0.40  | 0.25  | 0.25  | 0.11  | 0.38  | 0.38  | 0.12  | 0.40  | 0.40  |
| (v / s)_i Volume / Saturation Flow Rate | 0.24  | 0.18  | 0.18  | 0.18  | 0.25  | 0.25  | 0.09  | 0.39  | 0.40  | 0.11  | 0.30  | 0.20  |
| s, saturation flow rate [veh/h]         | 1956  | 1863  | 1801  | 1038  | 1863  | 1766  | 3445  | 3546  | 1790  | 1774  | 3547  | 1583  |
| c, Capacity [veh/h]                     | 562   | 529   | 511   | 352   | 465   | 441   | 368   | 1346  | 679   | 218   | 1403  | 626   |
| d1, Uniform Delay [s]                   | 52.21 | 56.01 | 56.04 | 39.29 | 67.55 | 67.55 | 79.27 | 55.84 | 55.84 | 78.00 | 46.75 | 41.07 |
| k, delay calibration                    | 0.33  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.11  | 0.50  | 0.50  | 0.28  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 9.74  | 5.38  | 5.58  | 5.62  | 45.05 | 46.76 | 6.94  | 34.15 | 49.45 | 28.33 | 3.73  | 2.89  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

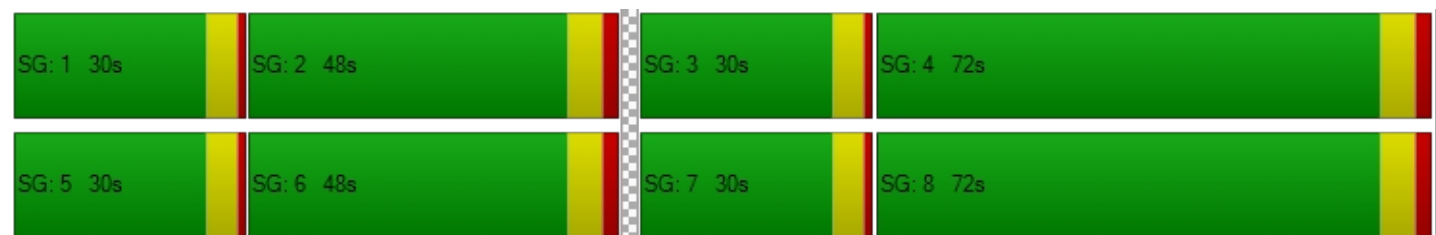
|                                       |        |        |        |        |        |        |        |         |         |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|--------|
| X, volume / capacity                  | 0.84   | 0.62   | 0.62   | 0.53   | 1.01   | 1.02   | 0.88   | 1.04    | 1.05    | 0.91   | 0.75   | 0.50   |
| d, Delay for Lane Group [s/veh]       | 61.95  | 61.39  | 61.62  | 44.91  | 112.59 | 114.31 | 86.21  | 89.99   | 105.29  | 106.32 | 50.49  | 43.96  |
| Lane Group LOS                        | E      | E      | E      | D      | F      | F      | F      | F       | F       | F      | D      | D      |
| Critical Lane Group                   | Yes    | No     | No     | No     | No     | Yes    | No     | No      | Yes     | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 8.04   | 13.61  | 13.22  | 6.10   | 26.86  | 25.67  | 7.74   | 36.39   | 39.64   | 10.70  | 20.51  | 10.93  |
| 50th-Percentile Queue Length [ft/ln]  | 201.10 | 340.24 | 330.50 | 152.59 | 671.40 | 641.67 | 193.61 | 909.86  | 991.00  | 267.39 | 512.68 | 273.27 |
| 95th-Percentile Queue Length [veh/ln] | 12.70  | 19.66  | 19.18  | 10.16  | 35.65  | 34.30  | 12.31  | 47.51   | 51.94   | 16.06  | 27.93  | 16.35  |
| 95th-Percentile Queue Length [ft/ln]  | 317.38 | 491.50 | 479.58 | 253.88 | 891.24 | 857.59 | 307.71 | 1187.68 | 1298.44 | 401.47 | 698.35 | 408.82 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |        |        |        |       |       |        |        |       |       |
|---------------------------------|-------|-------|-------|--------|--------|--------|-------|-------|--------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 61.95 | 61.49 | 61.62 | 44.91  | 113.28 | 114.31 | 86.21 | 94.34 | 105.29 | 106.32 | 50.49 | 43.96 |
| Movement LOS                    | E     | E     | E     | D      | F      | F      | F     | F     | F      | F      | D     | D     |
| d_A, Approach Delay [s/veh]     | 61.69 |       |       | 101.83 |        |        | 93.99 |       |        | 56.26  |       |       |
| Approach LOS                    | E     |       |       | F      |        |        | F     |       |        | E      |       |       |
| d_I, Intersection Delay [s/veh] | 80.08 |       |       |        |        |        |       |       |        |        |       |       |
| Intersection LOS                | F     |       |       |        |        |        |       |       |        |        |       |       |
| Intersection V/C                | 0.929 |       |       |        |        |        |       |       |        |        |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 7: US 1/Queensbury Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 17.7  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.532

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Queensbury                                                                          |        |        | Queensbury                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 250.00                                                                            | 100.00 | 100.00 | 150.00                                                                            | 100.00 | 100.00 | 350.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 200.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 45.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | No                                                                                |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Queensbury |        |        | Queensbury |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 66     | 781    | 117    | 46     | 1010   | 34     | 67         | 115    | 76     | 137        | 123    | 168    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 1.89   | 3.85   | 2.00   | 3.85   | 1.96       | 2.30   | 1.85   | 1.69       | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 66     | 781    | 117    | 46     | 1010   | 34     | 67         | 115    | 76     | 137        | 123    | 168    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 18     | 217    | 33     | 13     | 281    | 9      | 19         | 32     | 21     | 38         | 34     | 47     |
| Total Analysis Volume [veh/h]           | 73     | 868    | 130    | 51     | 1122   | 38     | 74         | 128    | 84     | 152        | 137    | 187    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No         |        | No     | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 11     |        |        | 11         |        |        | 4          |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0          |        |        | 0          |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 6.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 2       | 6       | 6       | 6       | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 15      | 15      | 15      | 8       | 8       | 8       | 8       | 8       | 8       |
| Maximum Green [s]            | 8        | 60      | 60      | 46      | 46      | 46      | 20      | 20      | 20      | 20      | 20      | 20      |
| Amber [s]                    | 3.5      | 4.5     | 4.5     | 4.5     | 4.5     | 4.5     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0      | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 13       | 65      | 65      | 52      | 52      | 52      | 25      | 25      | 25      | 25      | 25      | 25      |
| Vehicle Extension [s]        | 3.0      | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 2.5      | 3.5     | 3.5     | 3.5     | 3.5     | 3.5     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | No       | Yes     |         |         | Yes     |         |         | No      |         |         | No      |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 294.0   | 294.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0     | 6.0     | 6.0     | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | L     | C     | C     | L     | C     | L     | C     | R     |
|-----------------------------------------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90   | 90   | 90   | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.50 | 5.50 | 5.50 | 5.50  | 5.50  | 5.50  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00 | 3.50 | 3.50 | 3.50  | 3.50  | 3.50  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 60   | 60   | 60   | 51    | 51    | 51    | 20    | 20    | 20    | 20    | 20    |
| g / C, Green / Cycle                    | 0.66 | 0.66 | 0.66 | 0.56  | 0.56  | 0.56  | 0.22  | 0.22  | 0.22  | 0.22  | 0.22  |
| (v / s)_i Volume / Saturation Flow Rate | 0.12 | 0.27 | 0.27 | 0.09  | 0.31  | 0.31  | 0.06  | 0.12  | 0.13  | 0.07  | 0.12  |
| s, saturation flow rate [veh/h]         | 630  | 1863 | 1777 | 552   | 1863  | 1840  | 1238  | 1736  | 1168  | 1863  | 1560  |
| c, Capacity [veh/h]                     | 437  | 1232 | 1175 | 306   | 1049  | 1036  | 251   | 386   | 188   | 414   | 347   |
| d1, Uniform Delay [s]                   | 7.63 | 7.12 | 7.12 | 17.26 | 12.50 | 12.51 | 35.55 | 31.02 | 42.05 | 29.39 | 30.94 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.12  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.82 | 1.03 | 1.08 | 1.17  | 2.12  | 2.16  | 0.65  | 1.22  | 8.47  | 0.46  | 1.31  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |        |       |        |        |        |        |
|---------------------------------------|-------|--------|--------|-------|--------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.17  | 0.41   | 0.41   | 0.17  | 0.56   | 0.56   | 0.29  | 0.55   | 0.81   | 0.33   | 0.54   |
| d, Delay for Lane Group [s/veh]       | 8.46  | 8.15   | 8.20   | 18.43 | 14.62  | 14.66  | 36.20 | 32.24  | 50.52  | 29.86  | 32.25  |
| Lane Group LOS                        | A     | A      | A      | B     | B      | B      | D     | C      | D      | C      | C      |
| Critical Lane Group                   | Yes   | No     | No     | No    | No     | Yes    | No    | No     | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 0.47  | 3.80   | 3.65   | 0.73  | 6.85   | 6.79   | 1.51  | 4.13   | 3.80   | 2.50   | 3.64   |
| 50th-Percentile Queue Length [ft/ln]  | 11.84 | 95.05  | 91.27  | 18.18 | 171.23 | 169.69 | 37.85 | 103.27 | 95.11  | 62.56  | 91.12  |
| 95th-Percentile Queue Length [veh/ln] | 0.85  | 6.84   | 6.57   | 1.31  | 11.14  | 11.06  | 2.72  | 7.44   | 6.85   | 4.50   | 6.56   |
| 95th-Percentile Queue Length [ft/ln]  | 21.32 | 171.08 | 164.29 | 32.73 | 278.53 | 276.51 | 68.12 | 185.88 | 171.20 | 112.61 | 164.02 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 8.46  | 8.17 | 8.20 | 18.43 | 14.64 | 14.66 | 36.20 | 32.24 | 32.24 | 50.52 | 29.86 | 32.25 |
| Movement LOS                    | A     | A    | A    | B     | B     | B     | D     | C     | C     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 8.19  |      |      | 14.80 |       |       | 33.27 |       |       | 37.39 |       |       |
| Approach LOS                    | A     |      |      | B     |       |       | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 17.74 |      |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.532 |      |      |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 8: US 1/Oglethorpe Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 11.9  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.524

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Oglethorpe                                                                          |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 35.00                                                                             |        | 40.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | No                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Oglethorpe |        |
|-----------------------------------------|--------|--------|--------|--------|------------|--------|
| Base Volume Input [veh/h]               | 21     | 973    | 1208   | 40     | 117        | 54     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.04   | 1.97   | 0.00   | 1.67       | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0          | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0          | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0          | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0          | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0          | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0          | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0          | 0      |
| Total Hourly Volume [veh/h]             | 21     | 973    | 1208   | 40     | 117        | 54     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 6      | 270    | 336    | 11     | 33         | 15     |
| Total Analysis Volume [veh/h]           | 23     | 1081   | 1342   | 44     | 130        | 60     |
| Presence of On-Street Parking           | No     | No     | No     | No     | No         | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0          | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0          | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0          |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0          |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 66.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 2          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |       |       |
| Lead / Lag                   | Lag        | -          | -          | -          | Lag   | -     |
| Minimum Green [s]            | 15         | 15         | 15         | 15         | 15    | 15    |
| Maximum Green [s]            | 85         | 85         | 85         | 85         | 25    | 25    |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 90         | 90         | 90         | 90         | 30    | 30    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 0          | 0          | 0          | 0          | 7     | 7     |
| Pedestrian Clearance [s]     | 0          | 0          | 0          | 0          | 10    | 10    |
| Rest In Walk                 |            | No         | No         |            | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Minimum Recall               |            | No         | No         |            | No    |       |
| Maximum Recall               |            | Yes        | Yes        |            | Yes   |       |
| Pedestrian Recall            |            | No         | No         |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C    | C    | C     |
|-----------------------------------------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00 | 3.00 | 3.00 | 3.00 | 3.00  |
| g_i, Effective Green Time [s]           | 85   | 85   | 85   | 85   | 25    |
| g / C, Green / Cycle                    | 0.71 | 0.71 | 0.71 | 0.71 | 0.21  |
| (v / s)_i Volume / Saturation Flow Rate | 0.32 | 0.32 | 0.37 | 0.38 | 0.11  |
| s, saturation flow rate [veh/h]         | 1725 | 1694 | 1863 | 1843 | 1743  |
| c, Capacity [veh/h]                     | 1253 | 1200 | 1320 | 1305 | 363   |
| d1, Uniform Delay [s]                   | 7.28 | 7.54 | 8.13 | 8.18 | 42.20 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.50  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 1.15 | 1.25 | 1.50 | 1.55 | 5.31  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.44   | 0.46   | 0.53   | 0.53   | 0.52   |
| d, Delay for Lane Group [s/veh]       | 8.43   | 8.78   | 9.62   | 9.73   | 47.51  |
| Lane Group LOS                        | A      | A      | A      | A      | D      |
| Critical Lane Group                   | No     | No     | No     | Yes    | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 5.66   | 5.75   | 7.59   | 7.65   | 5.60   |
| 50th-Percentile Queue Length [ft/ln]  | 141.41 | 143.83 | 189.84 | 191.33 | 139.89 |
| 95th-Percentile Queue Length [veh/ln] | 9.56   | 9.69   | 12.11  | 12.19  | 9.48   |
| 95th-Percentile Queue Length [ft/ln]  | 238.92 | 242.17 | 302.82 | 304.76 | 236.88 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |       |       |
|---------------------------------|-------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 8.43  | 8.61 | 9.68 | 9.73 | 47.51 | 47.51 |
| Movement LOS                    | A     | A    | A    | A    | D     | D     |
| d_A, Approach Delay [s/veh]     | 8.61  |      | 9.68 |      | 47.51 |       |
| Approach LOS                    | A     |      | A    |      | D     |       |
| d_I, Intersection Delay [s/veh] | 11.92 |      |      |      |       |       |
| Intersection LOS                | B     |      |      |      |       |       |
| Intersection V/C                | 0.524 |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 90s

SG: 4 30s

SG: 104 17s

SG: 6 90s

### Intersection Level Of Service Report

#### Intersection 9: US 1/Madison St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 16.9  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.639

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Madison                                                                             |        |        | Madison                                                                             |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Madison |        |        | Madison |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|---------|--------|--------|---------|--------|--------|
| Base Volume Input [veh/h]               | 72     | 925    | 12     | 7      | 1159   | 91     | 109     | 20     | 114    | 68      | 61     | 22     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.00   | 0.00   | 0.00   | 2.00   | 0.00   | 0.00    | 0.00   | 0.00   | 0.00    | 0.00   | 1.61   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00    | 1.00   | 1.00   | 1.00    | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Total Hourly Volume [veh/h]             | 72     | 925    | 12     | 7      | 1159   | 91     | 109     | 20     | 114    | 68      | 61     | 22     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000  | 0.9000 | 0.9000 | 0.9000  | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 20     | 257    | 3      | 2      | 322    | 25     | 30      | 6      | 32     | 19      | 17     | 6      |
| Total Analysis Volume [veh/h]           | 80     | 1028   | 13     | 8      | 1288   | 101    | 121     | 22     | 127    | 76      | 68     | 24     |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No      |        | No     | No      |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 2       |        |        | 0       |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0       |        |        | 0       |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 74.0                            |
| Offset Reference          | LagEnd                          |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 2       | 2       | 2       | 6       | 6       | 6       | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 20      | 20      | 20      | 20      | 15      | 15      | 15      | 15      | 15      | 15      |
| Maximum Green [s]            | 85      | 85      | 85      | 85      | 85      | 85      | 25      | 25      | 25      | 25      | 25      | 25      |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 90      | 90      | 90      | 90      | 90      | 90      | 30      | 30      | 30      | 30      | 30      | 30      |
| Vehicle Extension [s]        | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 7       | 7       | 7       | 7       | 7       | 7       | 7       | 7       | 7       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 13      | 13      | 13      | 13      | 13      | 13      | 10      | 10      | 10      | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               |         | Yes     |         |         | Yes     |         |         | Yes     |         |         | Yes     |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C    | C    | L     | C    | C    | C     | C     |
|-----------------------------------------|-------|------|------|-------|------|------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120  | 120  | 120   | 120  | 120  | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00 | 5.00 | 5.00  | 5.00 | 5.00 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 2.00  | 0.00 | 0.00 | 2.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00 | 3.00 | 3.00  | 3.00 | 3.00 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 85    | 85   | 85   | 85    | 85   | 85   | 25    | 25    |
| g / C, Green / Cycle                    | 0.71  | 0.71 | 0.71 | 0.71  | 0.71 | 0.71 | 0.21  | 0.21  |
| (v / s)_i Volume / Saturation Flow Rate | 0.20  | 0.28 | 0.28 | 0.01  | 0.38 | 0.38 | 0.20  | 0.13  |
| s, saturation flow rate [veh/h]         | 395   | 1863 | 1855 | 551   | 1863 | 1815 | 1375  | 1312  |
| c, Capacity [veh/h]                     | 264   | 1319 | 1314 | 379   | 1319 | 1286 | 330   | 317   |
| d1, Uniform Delay [s]                   | 17.54 | 7.09 | 7.09 | 10.80 | 8.19 | 8.21 | 47.14 | 42.60 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50 | 0.50 | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 2.92  | 0.89 | 0.89 | 0.10  | 1.54 | 1.60 | 19.82 | 6.23  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |        |        |        |
|---------------------------------------|-------|--------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.30  | 0.40   | 0.40   | 0.02  | 0.53   | 0.53   | 0.82   | 0.53   |
| d, Delay for Lane Group [s/veh]       | 20.46 | 7.98   | 7.98   | 10.90 | 9.73   | 9.81   | 66.96  | 48.82  |
| Lane Group LOS                        | C     | A      | A      | B     | A      | A      | E      | D      |
| Critical Lane Group                   | No    | No     | No     | No    | No     | Yes    | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 1.52  | 5.12   | 5.10   | 0.10  | 8.01   | 7.88   | 9.82   | 5.10   |
| 50th-Percentile Queue Length [ft/ln]  | 37.93 | 127.90 | 127.39 | 2.49  | 200.18 | 197.06 | 245.44 | 127.56 |
| 95th-Percentile Queue Length [veh/ln] | 2.73  | 8.83   | 8.80   | 0.18  | 12.65  | 12.49  | 14.96  | 8.81   |
| 95th-Percentile Queue Length [ft/ln]  | 68.27 | 220.63 | 219.94 | 4.48  | 316.20 | 312.17 | 373.90 | 220.18 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 20.46 | 7.98 | 7.98 | 10.90 | 9.76 | 9.81 | 66.96 | 66.96 | 66.96 | 48.82 | 48.82 | 48.82 |
| Movement LOS                    | C     | A    | A    | B     | A    | A    | E     | E     | E     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 8.87  |      |      | 9.77  |      |      | 66.96 |       |       | 48.82 |       |       |
| Approach LOS                    | A     |      |      | A     |      |      | E     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 16.87 |      |      |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.639 |      |      |       |      |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 90s

SG: 4 30s

SG: 102 20s

SG: 104 17s

SG: 6 90s

SG: 8 30s

SG: 106 20s

### Intersection Level Of Service Report

#### Intersection 10: US 1/Jefferson St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 19.9  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.757

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Jefferson St                                                                        |        |        |                                                                                     |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00 | 175.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | No                                                                                |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Jefferson St |        |        |        |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 301    | 950    | 1      | 7      | 1257   | 103    | 57           | 7      | 105    | 40     | 24     | 8      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.82   | 2.00   | 2.00   | 2.00   | 2.00   | 2.22   | 1.43         | 2.00   | 1.82   | 2.00   | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 301    | 950    | 1      | 7      | 1257   | 103    | 57           | 7      | 105    | 40     | 24     | 8      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 0.9000       | 1.0000 | 0.9000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 84     | 264    | 0      | 2      | 349    | 29     | 16           | 2      | 29     | 10     | 6      | 2      |
| Total Analysis Volume [veh/h]           | 334    | 1056   | 1      | 7      | 1397   | 114    | 63           | 7      | 117    | 40     | 24     | 8      |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No           |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 0            |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0            |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 90.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 0       | 0       | 6       | 6       | 4       | 4       | 4       | 0       | 4       | 0       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | -       | -       | -       | Lag     | -       | -       | -       | -       | -       |
| Minimum Green [s]            | 8        | 20      | 0       | 0       | 20      | 20      | 20      | 20      | 20      | 0       | 20      | 0       |
| Maximum Green [s]            | 15       | 90      | 0       | 0       | 70      | 70      | 20      | 20      | 20      | 0       | 20      | 0       |
| Amber [s]                    | 4.0      | 4.0     | 0.0     | 0.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                  | 1.0      | 1.0     | 0.0     | 0.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 20       | 95      | 0       | 0       | 75      | 75      | 25      | 25      | 25      | 0       | 25      | 0       |
| Vehicle Extension [s]        | 3.0      | 3.0     | 0.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 7       | 7       | 7       | 7       | 7       | 0       | 7       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 13      | 13      | 13      | 13      | 13      | 0       | 13      | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 3.0     | 0.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 0.0     | 3.0     | 0.0     |
| Minimum Recall               | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | Yes      | Yes     |         |         | Yes     |         |         | No      |         |         | No      |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | C    | L     | C     | C     | C     | C     |
|-----------------------------------------|-------|------|------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120  | 120  | 120   | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 3.00 | 3.00 | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 90    | 90   | 90   | 70    | 70    | 70    | 20    | 20    |
| g / C, Green / Cycle                    | 0.75  | 0.75 | 0.75 | 0.58  | 0.58  | 0.58  | 0.17  | 0.17  |
| (v / s)_i Volume / Saturation Flow Rate | 0.53  | 0.28 | 0.28 | 0.01  | 0.41  | 0.41  | 0.12  | 0.06  |
| s, saturation flow rate [veh/h]         | 632   | 1863 | 1862 | 532   | 1863  | 1814  | 1553  | 1150  |
| c, Capacity [veh/h]                     | 464   | 1397 | 1397 | 309   | 1087  | 1058  | 299   | 238   |
| d1, Uniform Delay [s]                   | 23.91 | 5.23 | 5.23 | 17.23 | 17.63 | 17.73 | 47.16 | 44.03 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  | 0.21  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 9.28  | 0.78 | 0.78 | 0.14  | 3.79  | 3.99  | 4.09  | 0.71  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |       |        |        |        |       |
|---------------------------------------|--------|--------|--------|-------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.72   | 0.38   | 0.38   | 0.02  | 0.70   | 0.71   | 0.63   | 0.30  |
| d, Delay for Lane Group [s/veh]       | 33.19  | 6.02   | 6.02   | 17.37 | 21.42  | 21.73  | 51.25  | 44.73 |
| Lane Group LOS                        | C      | A      | A      | B     | C      | C      | D      | D     |
| Critical Lane Group                   | Yes    | No     | No     | No    | No     | No     | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.34   | 4.16   | 4.16   | 0.12  | 15.05  | 14.91  | 5.67   | 1.95  |
| 50th-Percentile Queue Length [ft/ln]  | 83.60  | 103.92 | 103.90 | 2.89  | 376.33 | 372.75 | 141.70 | 48.87 |
| 95th-Percentile Queue Length [veh/ln] | 6.02   | 7.48   | 7.48   | 0.21  | 21.42  | 21.24  | 9.57   | 3.52  |
| 95th-Percentile Queue Length [ft/ln]  | 150.48 | 187.06 | 187.02 | 5.19  | 535.40 | 531.07 | 239.31 | 87.97 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 33.19 | 6.02 | 6.02 | 17.37 | 21.56 | 21.73 | 51.25 | 51.25 | 51.25 | 44.73 | 44.73 | 44.73 |
| Movement LOS                    | C     | A    | A    | B     | C     | C     | D     | D     | D     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 12.54 |      |      | 21.55 |       |       | 51.25 |       |       | 44.73 |       |       |
| Approach LOS                    | B     |      |      | C     |       |       | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 19.88 |      |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.757 |      |      |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 95s

SG: 4 25s

SG: 104 20s

SG: 5 20s

SG: 6 75s

SG: 106 20s



### Intersection Level Of Service Report

#### Intersection 11: US 1/Hamilton St (North)

Control Type: Two-way stop  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 14.1  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.003

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                                |        | Hamilton St (North)                                                                 |        |
|------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                          |        | Westbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                                | Thru   | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1                                                                                   | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 150.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 35.00                                                                               |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Hamilton St (North) |        |
|-----------------------------------------|--------|--------|--------|--------|---------------------|--------|
| Base Volume Input [veh/h]               | 1228   | 4      | 2      | 1370   | 0                   | 1      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000              | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 0.00   | 0.00   | 2.04   | 0.00                | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00                | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0                   | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0                   | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0                   | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0                   | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0                   | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0                   | 0      |
| Total Hourly Volume [veh/h]             | 1228   | 4      | 2      | 1370   | 0                   | 1      |
| Peak Hour Factor                        | 0.9000 | 1.0000 | 1.0000 | 0.9000 | 1.0000              | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000              | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 341    | 1      | 1      | 381    | 0                   | 0      |
| Total Analysis Volume [veh/h]           | 1364   | 4      | 2      | 1522   | 0                   | 1      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0                   |        |

**Intersection Settings**

| Priority Scheme                    | Free | Free | Stop |
|------------------------------------|------|------|------|
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |       |       |
|---------------------------------------|------|------|------|------|-------|-------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.02 | 0.00  | 0.00  |
| d_M, Delay for Movement [s/veh]       | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 14.12 |
| Movement LOS                          | A    | A    |      | A    |       | B     |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.01  |
| 95th-Percentile Queue Length [ft/ln]  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.19  |
| d_A, Approach Delay [s/veh]           | 0.00 |      | 0.00 |      | 14.12 |       |
| Approach LOS                          | A    |      | A    |      | B     |       |
| d_I, Intersection Delay [s/veh]       | 0.00 |      |      |      |       |       |
| Intersection LOS                      | B    |      |      |      |       |       |

### Intersection Level Of Service Report

#### Intersection 12: US 1/Hamilton St (South)/US 1 Alt

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 58.7  |
| Analysis Method: | HCM 2010   | Level Of Service:         | E     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.893 |

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Hamilton  |        |        | US 1 ALT                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-----------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound |        |        | Northwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |           |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left      | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00     | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0         | 0      | 0      | 0                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00    | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 250.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 25.00     |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00      |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes       |        |        | No                                                                                  |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Hamilton |        |        | US 1 ALT |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]               | 0      | 328    | 20     | 466    | 901    | 0      | 7        | 7      | 10     | 95       | 76     | 902    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.17   | 0.00   | 2.00   | 2.06   | 0.00   | 0.00     | 0.00   | 0.00   | 2.63     | 0.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0      | 328    | 20     | 466    | 901    | 0      | 7        | 7      | 10     | 95       | 76     | 902    |
| Peak Hour Factor                        | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 | 0.9000   | 0.9000 | 0.9000 | 0.9000   | 1.0000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0      | 91     | 6      | 129    | 250    | 0      | 2        | 2      | 3      | 26       | 19     | 251    |
| Total Analysis Volume [veh/h]           | 0      | 364    | 22     | 518    | 1001   | 0      | 8        | 8      | 11     | 106      | 76     | 1002   |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     |          |        |        | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 3        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Semi-actuated                   |
| Offset [s]                | 18.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Split | Split | Permiss | Permiss | Overlap |
|------------------------------|---------|---------|---------|----------|---------|---------|---------|-------|-------|---------|---------|---------|
| Signal group                 | 0       | 6       | 6       | 5        | 2       | 0       | 3       | 3     | 3     | 8       | 8       | 8       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |         |       |       |         |         | 5,8     |
| Lead / Lag                   | -       | -       | -       | Lead     | -       | -       | -       | -     | -     | Lag     | -       | -       |
| Minimum Green [s]            | 0       | 20      | 20      | 4        | 20      | 0       | 0       | 0     | 0     | 5       | 5       | 5       |
| Maximum Green [s]            | 0       | 55      | 55      | 20       | 63      | 0       | 0       | 0     | 0     | 30      | 30      | 30      |
| Amber [s]                    | 0.0     | 4.0     | 4.0     | 4.0      | 4.0     | 0.0     | 0.0     | 0.0   | 0.0   | 3.0     | 3.0     | 3.0     |
| All red [s]                  | 0.0     | 1.0     | 1.0     | 0.0      | 1.0     | 0.0     | 0.0     | 0.0   | 0.0   | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 0       | 50      | 50      | 15       | 65      | 0       | 0       | 0     | 0     | 55      | 55      | 55      |
| Vehicle Extension [s]        | 0.0     | 3.0     | 3.0     | 3.0      | 3.0     | 0.0     | 0.0     | 0.0   | 0.0   | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0     | 0     | 5       | 5       | 5       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0     | 0     | 10      | 10      | 10      |
| Rest In Walk                 |         | No      |         |          | No      |         |         |       |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 2.0     | 2.0      | 2.0     | 0.0     | 0.0     | 0.0   | 0.0   | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 3.0     | 2.0      | 3.0     | 0.0     | 0.0     | 0.0   | 0.0   | 2.0     | 2.0     | 2.0     |
| Minimum Recall               |         | No      |         | Yes      | No      |         |         |       |       |         | No      | No      |
| Maximum Recall               |         | Yes     |         | No       | Yes     |         |         |       |       |         | No      | No      |
| Pedestrian Recall            |         | No      |         | No       | No      |         |         |       |       |         | No      | No      |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 50.0    | 50.0    | 0.0      | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C     | C     |  | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|--|-------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   | 120   |  | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |  | 4.00  | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 0.00  | 3.00  | 3.00  |  | 2.00  | 0.00  |
| g_i, Effective Green Time [s]           | 45    | 45    | 60    | 60    | 60    |  | 51    | 66    |
| g / C, Green / Cycle                    | 0.38  | 0.38  | 0.50  | 0.50  | 0.50  |  | 0.43  | 0.55  |
| (v / s)_i Volume / Saturation Flow Rate | 0.10  | 0.11  | 0.48  | 0.34  | 0.34  |  | 0.10  | 0.63  |
| s, saturation flow rate [veh/h]         | 1860  | 1823  | 1082  | 1470  | 1470  |  | 1846  | 1583  |
| c, Capacity [veh/h]                     | 697   | 684   | 549   | 735   | 735   |  | 785   | 871   |
| d1, Uniform Delay [s]                   | 26.15 | 26.21 | 32.85 | 22.75 | 22.75 |  | 22.01 | 27.00 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |  | 0.11  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.98  | 1.03  | 26.75 | 5.05  | 5.05  |  | 0.15  | 80.99 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |  |        |         |
|---------------------------------------|--------|--------|--------|--------|--------|--|--------|---------|
| X, volume / capacity                  | 0.28   | 0.28   | 0.94   | 0.68   | 0.68   |  | 0.23   | 1.15    |
| d, Delay for Lane Group [s/veh]       | 27.14  | 27.24  | 59.60  | 27.80  | 27.80  |  | 22.16  | 107.99  |
| Lane Group LOS                        | C      | C      | E      | C      | C      |  | C      | F       |
| Critical Lane Group                   | No     | No     | Yes    | No     | No     |  | No     | Yes     |
| 50th-Percentile Queue Length [veh/ln] | 4.06   | 4.07   | 15.41  | 11.49  | 11.49  |  | 3.37   | 43.48   |
| 50th-Percentile Queue Length [ft/ln]  | 101.40 | 101.76 | 385.21 | 287.29 | 287.29 |  | 84.14  | 1086.90 |
| 95th-Percentile Queue Length [veh/ln] | 7.30   | 7.33   | 21.85  | 17.05  | 17.05  |  | 6.06   | 60.56   |
| 95th-Percentile Queue Length [ft/ln]  | 182.52 | 183.17 | 546.15 | 426.28 | 426.28 |  | 151.46 | 1514.04 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |      |      |      |       |       |        |
|---------------------------------|-------|-------|-------|-------|-------|-------|------|------|------|-------|-------|--------|
| d_M, Delay for Movement [s/veh] | 0.00  | 27.19 | 27.24 | 59.60 | 27.80 | 27.80 | 0.00 | 0.00 | 0.00 | 22.16 | 22.16 | 107.99 |
| Movement LOS                    |       | C     | C     | E     | C     | C     |      |      |      | C     | C     | F      |
| d_A, Approach Delay [s/veh]     | 27.19 |       |       | 38.64 |       |       | 0.00 |      |      | 94.80 |       |        |
| Approach LOS                    | C     |       |       | D     |       |       | A    |      |      | F     |       |        |
| d_I, Intersection Delay [s/veh] | 58.74 |       |       |       |       |       |      |      |      |       |       |        |
| Intersection LOS                | E     |       |       |       |       |       |      |      |      |       |       |        |
| Intersection V/C                | 0.893 |       |       |       |       |       |      |      |      |       |       |        |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 13: US 1 Alt/Decatur St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 44.4  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.746

#### Intersection Setup

| Name                   | US 1 ALT                                                                          |        | Decatur St                                                                         |       | US 1 ALT                                                                            |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Westbound                                                                          |       | Southwestbound                                                                      |        |
| Lane Configuration     |  |        |  |       |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Right | Left                                                                                | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00 | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 1      | 0                                                                                  | 1     | 1                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 75.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |       | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |       | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |       | No                                                                                  |        |

#### Volumes

| Name                                    | US 1 ALT |        | Decatur St |        | US 1 ALT |        |
|-----------------------------------------|----------|--------|------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 667      | 49     | 139        | 332    | 119      | 432    |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000     | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.13     | 2.13   | 1.97       | 2.00   | 2.63     | 2.00   |
| Growth Rate                             | 1.00     | 1.00   | 1.00       | 1.00   | 1.00     | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0          | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 0        | 0      | 0          | 0      | 0        | 0      |
| Diverted Trips [veh/h]                  | 0        | 0      | 0          | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0          | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0          | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0          | 0      | 0        | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0          | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 667      | 49     | 139        | 332    | 119      | 432    |
| Peak Hour Factor                        | 0.9000   | 0.9000 | 0.9000     | 0.9000 | 0.9000   | 0.9000 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000     | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 185      | 14     | 39         | 92     | 33       | 120    |
| Total Analysis Volume [veh/h]           | 741      | 54     | 154        | 369    | 132      | 480    |
| Presence of On-Street Parking           | No       | No     | No         | No     | No       | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0          | 0      | 0        | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0          | 0      | 0        | 0      |
| Pedestrian Volume [ped/h]               | 0        |        | 0          |        | 0        |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0          |        | 0        |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 80             |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 15.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 9.00           |

**Phasing & Timing**

| Control Type                 | Permissive | Unsignalized | Split | Split | ProtectedPermissi | Permissive |
|------------------------------|------------|--------------|-------|-------|-------------------|------------|
| Signal group                 | 6          | 0            | 4     | 0     | 5                 | 2          |
| Auxiliary Signal Groups      |            |              |       |       |                   |            |
| Lead / Lag                   | -          | -            | Lag   | -     | Lead              | -          |
| Minimum Green [s]            | 10         | 0            | 5     | 0     | 4                 | 10         |
| Maximum Green [s]            | 39         | 0            | 15    | 0     | 10                | 54         |
| Amber [s]                    | 5.0        | 0.0          | 4.0   | 0.0   | 4.0               | 5.0        |
| All red [s]                  | 1.0        | 0.0          | 1.0   | 0.0   | 1.0               | 1.0        |
| Split [s]                    | 30         | 0            | 30    | 0     | 30                | 30         |
| Vehicle Extension [s]        | 0.2        | 0.0          | 3.0   | 0.0   | 3.0               | 0.2        |
| Walk [s]                     | 0          | 0            | 0     | 0     | 0                 | 0          |
| Pedestrian Clearance [s]     | 0          | 0            | 0     | 0     | 0                 | 0          |
| Rest In Walk                 | No         |              | No    |       |                   | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 0.0          | 2.0   | 0.0   | 2.0               | 2.0        |
| I2, Clearance Lost Time [s]  | 4.0        | 0.0          | 3.0   | 0.0   | 3.0               | 4.0        |
| Minimum Recall               | No         |              | No    |       | No                | No         |
| Maximum Recall               | Yes        |              | No    |       | No                | Yes        |
| Pedestrian Recall            | No         |              | No    |       | No                | No         |
| Detector Location [ft]       | 0.0        | 0.0          | 0.0   | 0.0   | 0.0               | 0.0        |
| Detector Length [ft]         | 30.0       | 0.0          | 30.0  | 0.0   | 30.0              | 30.0       |
| I, Upstream Filtering Factor | 1.00       | 1.00         | 1.00  | 1.00  | 1.00              | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L     | R      | L    | C    |
|-----------------------------------------|-------|-------|--------|------|------|
| C, Cycle Length [s]                     | 80    | 80    | 80     | 80   | 80   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 5.00  | 5.00   | 6.00 | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00   | 0.00 | 0.00 |
| l2, Clearance Lost Time [s]             | 4.00  | 3.00  | 3.00   | 0.00 | 4.00 |
| g_i, Effective Green Time [s]           | 45    | 15    | 15     | 54   | 54   |
| g / C, Green / Cycle                    | 0.56  | 0.19  | 0.19   | 0.68 | 0.68 |
| (v / s)_i Volume / Saturation Flow Rate | 0.40  | 0.09  | 0.23   | 0.16 | 0.26 |
| s, saturation flow rate [veh/h]         | 1860  | 1775  | 1583   | 849  | 1863 |
| c, Capacity [veh/h]                     | 1045  | 333   | 297    | 491  | 1257 |
| d1, Uniform Delay [s]                   | 12.79 | 28.92 | 32.50  | 9.11 | 5.69 |
| k, delay calibration                    | 0.50  | 0.11  | 0.50   | 0.50 | 0.50 |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00   | 1.00 | 1.00 |
| d2, Incremental Delay [s]               | 4.08  | 1.00  | 134.53 | 1.34 | 0.88 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00   | 0.00 | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00   | 1.00 | 1.00 |
| PF, progression factor                  | 1.00  | 1.00  | 1.00   | 1.00 | 1.00 |

**Lane Group Results**

|                                       |        |        |        |       |        |
|---------------------------------------|--------|--------|--------|-------|--------|
| X, volume / capacity                  | 0.71   | 0.46   | 1.24   | 0.27  | 0.38   |
| d, Delay for Lane Group [s/veh]       | 16.86  | 29.92  | 167.03 | 10.46 | 6.57   |
| Lane Group LOS                        | B      | C      | F      | B     | A      |
| Critical Lane Group                   | Yes    | No     | Yes    | Yes   | No     |
| 50th-Percentile Queue Length [veh/ln] | 9.60   | 2.65   | 16.64  | 0.80  | 3.11   |
| 50th-Percentile Queue Length [ft/ln]  | 240.02 | 66.28  | 415.94 | 20.05 | 77.82  |
| 95th-Percentile Queue Length [veh/ln] | 14.68  | 4.77   | 25.82  | 1.44  | 5.60   |
| 95th-Percentile Queue Length [ft/ln]  | 367.05 | 119.30 | 645.43 | 36.10 | 140.08 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |        |        |       |      |
|---------------------------------|-------|------|--------|--------|-------|------|
| d_M, Delay for Movement [s/veh] | 16.86 | 0.00 | 29.92  | 167.03 | 10.46 | 6.57 |
| Movement LOS                    | B     |      | C      | F      | B     | A    |
| d_A, Approach Delay [s/veh]     | 16.86 |      | 126.66 |        | 7.41  |      |
| Approach LOS                    | B     |      | F      |        | A     |      |
| d_I, Intersection Delay [s/veh] | 44.39 |      |        |        |       |      |
| Intersection LOS                | D     |      |        |        |       |      |
| Intersection V/C                | 0.746 |      |        |        |       |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 14: US 1 Alt/Charles Armentrout St

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 32.8  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.730 |

#### Intersection Setup

| Name                   | US 1 Alt                                                                          |        | US 1 ALT                                                                           |        | Charles L Armentrout                                                                |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1 Alt |        | US 1 ALT |        | Charles L Armentrout |        |
|-----------------------------------------|----------|--------|----------|--------|----------------------|--------|
| Base Volume Input [veh/h]               | 1070     | 786    | 481      | 146    | 18                   | 572    |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000   | 1.0000 | 1.0000               | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.08     | 2.00   | 2.00     | 2.00   | 3.85                 | 2.17   |
| Growth Rate                             | 1.00     | 1.00   | 1.00     | 1.00   | 1.00                 | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0        | 0      | 0                    | 0      |
| Site-Generated Trips [veh/h]            | 3        | 0      | 0        | 0      | 0                    | 12     |
| Diverted Trips [veh/h]                  | 0        | 0      | 0        | 0      | 0                    | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0        | 0      | 0                    | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0        | 0      | 0                    | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0        | 0      | 0                    | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0        | 0      | 0                    | 0      |
| Total Hourly Volume [veh/h]             | 1073     | 786    | 481      | 146    | 18                   | 584    |
| Peak Hour Factor                        | 0.9000   | 0.9000 | 0.9000   | 0.9000 | 0.9000               | 0.9000 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000   | 1.0000 | 1.0000               | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 298      | 218    | 134      | 41     | 5                    | 162    |
| Total Analysis Volume [veh/h]           | 1192     | 873    | 534      | 162    | 20                   | 649    |
| Presence of On-Street Parking           | No       | No     | No       | No     | No                   | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0        | 0      | 0                    | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0        | 0      | 0                    | 0      |
| Pedestrian Volume [ped/h]               | 0        |        | 0        |        | 0                    |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0        |        | 0                    |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | ProtectedPermissi | Permissive | Permissive | Permissive | Permissive | Unsignalized |
|------------------------------|-------------------|------------|------------|------------|------------|--------------|
| Signal group                 | 5                 | 2          | 6          | 0          | 3          | 3            |
| Auxiliary Signal Groups      |                   |            |            |            |            |              |
| Lead / Lag                   | Lead              | -          | -          | -          | Lead       | -            |
| Minimum Green [s]            | 5                 | 5          | 5          | 0          | 5          | 5            |
| Maximum Green [s]            | 30                | 30         | 30         | 0          | 30         | 30           |
| Amber [s]                    | 3.0               | 3.0        | 3.0        | 0.0        | 3.0        | 3.0          |
| All red [s]                  | 0.0               | 1.0        | 1.0        | 0.0        | 1.0        | 1.0          |
| Split [s]                    | 49                | 81         | 32         | 0          | 39         | 39           |
| Vehicle Extension [s]        | 3.0               | 3.0        | 3.0        | 0.0        | 3.0        | 3.0          |
| Walk [s]                     | 0                 | 5          | 5          | 0          | 5          | 5            |
| Pedestrian Clearance [s]     | 0                 | 10         | 10         | 0          | 10         | 10           |
| Rest In Walk                 |                   | No         | No         |            | No         |              |
| I1, Start-Up Lost Time [s]   | 2.0               | 2.0        | 2.0        | 0.0        | 2.0        | 2.0          |
| I2, Clearance Lost Time [s]  | 1.0               | 2.0        | 2.0        | 0.0        | 2.0        | 2.0          |
| Minimum Recall               | No                | No         | No         |            | No         |              |
| Maximum Recall               | No                | No         | No         |            | No         |              |
| Pedestrian Recall            | No                | No         | No         |            | No         |              |
| Detector Location [ft]       | 0.0               | 0.0        | 0.0        | 0.0        | 0.0        | 0.0          |
| Detector Length [ft]         | 0.0               | 0.0        | 0.0        | 0.0        | 0.0        | 0.0          |
| I, Upstream Filtering Factor | 1.00              | 1.00       | 1.00       | 1.00       | 1.00       | 1.00         |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C    | C     | R     | L     |
|-----------------------------------------|-------|------|-------|-------|-------|
| C, Cycle Length [s]                     | 63    | 63   | 63    | 63    | 63    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00 | 4.00  | 4.00  | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 2.00 | 2.00  | 2.00  | 2.00  |
| g_i, Effective Green Time [s]           | 54    | 54   | 21    | 21    | 2     |
| g / C, Green / Cycle                    | 0.85  | 0.85 | 0.33  | 0.33  | 0.02  |
| (v / s)_i Volume / Saturation Flow Rate | 0.86  | 0.47 | 0.29  | 0.10  | 0.01  |
| s, saturation flow rate [veh/h]         | 1390  | 1863 | 1863  | 1583  | 1743  |
| c, Capacity [veh/h]                     | 1117  | 1582 | 610   | 518   | 42    |
| d1, Uniform Delay [s]                   | 13.52 | 1.35 | 20.05 | 15.93 | 30.45 |
| k, delay calibration                    | 0.50  | 0.44 | 0.16  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 46.59 | 1.23 | 6.03  | 0.34  | 8.14  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |       |        |       |       |
|---------------------------------------|--------|-------|--------|-------|-------|
| X, volume / capacity                  | 1.07   | 0.55  | 0.88   | 0.31  | 0.48  |
| d, Delay for Lane Group [s/veh]       | 60.12  | 2.58  | 26.08  | 16.28 | 38.59 |
| Lane Group LOS                        | F      | A     | C      | B     | D     |
| Critical Lane Group                   | Yes    | No    | Yes    | No    | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 14.46  | 0.54  | 7.70   | 1.66  | 0.39  |
| 50th-Percentile Queue Length [ft/ln]  | 361.59 | 13.51 | 192.49 | 41.48 | 9.69  |
| 95th-Percentile Queue Length [veh/ln] | 21.86  | 0.97  | 12.25  | 2.99  | 0.70  |
| 95th-Percentile Queue Length [ft/ln]  | 546.42 | 24.33 | 306.25 | 74.66 | 17.44 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |       |      |
|---------------------------------|-------|------|-------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 60.12 | 2.58 | 26.08 | 16.28 | 38.59 | 0.00 |
| Movement LOS                    | F     | A    | C     | B     | D     |      |
| d_A, Approach Delay [s/veh]     | 35.79 |      | 23.80 |       | 38.59 |      |
| Approach LOS                    | D     |      | C     |       | D     |      |
| d_I, Intersection Delay [s/veh] | 32.81 |      |       |       |       |      |
| Intersection LOS                | C     |      |       |       |       |      |
| Intersection V/C                | 0.730 |      |       |       |       |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 2 | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 81s

SG: 3 39s

SG: 103 15s

SG: 5 49s

SG: 6 32s

SG: 106 15s

### Intersection Level Of Service Report

#### Intersection 15: US 1/Gallatin St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 3.9  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.339

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Gallatin St.                                                                        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 0.00                                                                                |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | No                                                                                  |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Gallatin St. |        |
|-----------------------------------------|--------|--------|--------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 18     | 341    | 952    | 65     | 10           | 10     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.11   | 2.05   | 0.00   | 0.00         | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00         | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0            | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 18     | 341    | 952    | 65     | 10           | 10     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000       | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 5      | 95     | 264    | 18     | 3            | 3      |
| Total Analysis Volume [veh/h]           | 20     | 379    | 1058   | 72     | 10           | 10     |
| Presence of On-Street Parking           | No     | No     | No     | No     | No           | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0            | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0            | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0            |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0            |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Semi-actuated                   |
| Offset [s]                | 2.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 6.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
|------------------------------|------------|------------|------------|------------|------------|------------|
| Signal group                 | 6          | 6          | 2          | 2          | 4          | 0          |
| Auxiliary Signal Groups      |            |            |            |            |            |            |
| Lead / Lag                   | Lag        | -          | -          | -          | Lead       | -          |
| Minimum Green [s]            | 4          | 4          | 4          | 4          | 5          | 0          |
| Maximum Green [s]            | 86         | 86         | 86         | 86         | 30         | 0          |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 3.0        | 0.0        |
| All red [s]                  | 0.0        | 0.0        | 0.0        | 0.0        | 1.0        | 0.0        |
| Split [s]                    | 75         | 75         | 75         | 75         | 15         | 0          |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 0.0        |
| Walk [s]                     | 0          | 0          | 0          | 0          | 5          | 0          |
| Pedestrian Clearance [s]     | 0          | 0          | 0          | 0          | 10         | 0          |
| Rest In Walk                 |            |            |            |            |            |            |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0        | 0.0        |
| I2, Clearance Lost Time [s]  | 2.0        | 2.0        | 2.0        | 2.0        | 2.0        | 0.0        |
| Minimum Recall               |            | No         | No         |            | No         |            |
| Maximum Recall               |            | Yes        | Yes        |            | No         |            |
| Pedestrian Recall            |            | No         | No         |            | No         |            |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |    |
|--------------------------|----|
| Pedestrian Signal Group  | 8  |
| Pedestrian Walk [s]      | 20 |
| Pedestrian Clearance [s] | 10 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C    | C    | C     |
|-----------------------------------------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 4.00 | 4.00 | 4.00 | 4.00 | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00 | 2.00 | 2.00 | 2.00 | 2.00  |
| g_i, Effective Green Time [s]           | 100  | 100  | 100  | 100  | 2     |
| g / C, Green / Cycle                    | 0.83 | 0.83 | 0.83 | 0.83 | 0.02  |
| (v / s)_i Volume / Saturation Flow Rate | 0.13 | 0.12 | 0.30 | 0.31 | 0.01  |
| s, saturation flow rate [veh/h]         | 1519 | 1693 | 1862 | 1821 | 1707  |
| c, Capacity [veh/h]                     | 1292 | 1403 | 1543 | 1509 | 35    |
| d1, Uniform Delay [s]                   | 1.96 | 2.00 | 2.52 | 2.55 | 58.24 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 0.25 | 0.22 | 0.67 | 0.71 | 13.73 |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |       |        |        |       |
|---------------------------------------|-------|-------|--------|--------|-------|
| X, volume / capacity                  | 0.15  | 0.15  | 0.37   | 0.37   | 0.57  |
| d, Delay for Lane Group [s/veh]       | 2.21  | 2.22  | 3.20   | 3.26   | 71.97 |
| Lane Group LOS                        | A     | A     | A      | A      | E     |
| Critical Lane Group                   | No    | No    | No     | Yes    | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 0.70  | 0.74  | 2.57   | 2.60   | 0.76  |
| 50th-Percentile Queue Length [ft/ln]  | 17.50 | 18.41 | 64.13  | 64.95  | 19.08 |
| 95th-Percentile Queue Length [veh/ln] | 1.26  | 1.33  | 4.62   | 4.68   | 1.37  |
| 95th-Percentile Queue Length [ft/ln]  | 31.50 | 33.13 | 115.44 | 116.91 | 34.35 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |       |       |
|---------------------------------|-------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 2.21  | 2.22 | 3.23 | 3.26 | 71.97 | 71.97 |
| Movement LOS                    | A     | A    | A    | A    | E     | E     |
| d_A, Approach Delay [s/veh]     | 2.22  |      | 3.23 |      | 71.97 |       |
| Approach LOS                    | A     |      | A    |      | E     |       |
| d_I, Intersection Delay [s/veh] | 3.86  |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |       |       |
| Intersection V/C                | 0.339 |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 75s

SG: 4 15s

SG: 8 30s

SG: 6 75s



### Intersection Level Of Service Report

#### Intersection 16: US 1/Farragut St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 10.0  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.347

#### Intersection Setup

| Name                   | US 1                                                                              |        | Farragut                                                                           |        | US 1                                                                                |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Southbound                                                                        |        | Eastbound                                                                          |        | Northeastbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Right  | Left                                                                                | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 25.00                                                                              |        | 35.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | Farragut |        | US 1   |        |
|-----------------------------------------|--------|--------|----------|--------|--------|--------|
| Base Volume Input [veh/h]               | 942    | 3      | 35       | 25     | 10     | 301    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.97   | 0.00   | 0.00     | 0.00   | 0.00   | 2.11   |
| Growth Rate                             | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0        | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0        | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0        | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0        | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0        | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0        | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0        | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 942    | 3      | 35       | 25     | 10     | 301    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 262    | 1      | 10       | 7      | 3      | 84     |
| Total Analysis Volume [veh/h]           | 1047   | 3      | 39       | 28     | 11     | 334    |
| Presence of On-Street Parking           | No     | No     | No       | No     | No     | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0        | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0        | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0        |        | 0      |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0        |        | 0      |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 96.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Split | Split | Permissive | Permissive |
|------------------------------|------------|------------|-------|-------|------------|------------|
| Signal group                 | 6          | 6          | 4     | 4     | 2          | 2          |
| Auxiliary Signal Groups      |            |            |       |       |            |            |
| Lead / Lag                   | -          | -          | Lag   | -     | Lag        | -          |
| Minimum Green [s]            | 20         | 20         | 20    | 20    | 20         | 20         |
| Maximum Green [s]            | 83         | 83         | 26    | 26    | 83         | 83         |
| Amber [s]                    | 5.0        | 5.0        | 4.0   | 4.0   | 5.0        | 5.0        |
| All red [s]                  | 1.0        | 1.0        | 1.0   | 1.0   | 1.0        | 1.0        |
| Split [s]                    | 89         | 89         | 31    | 31    | 89         | 89         |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0   | 3.0   | 3.0        | 3.0        |
| Walk [s]                     | 0          | 0          | 7     | 7     | 0          | 0          |
| Pedestrian Clearance [s]     | 0          | 0          | 13    | 13    | 0          | 0          |
| Rest In Walk                 | No         |            | No    |       |            | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0   | 2.0   | 2.0        | 2.0        |
| I2, Clearance Lost Time [s]  | 4.0        | 4.0        | 3.0   | 3.0   | 4.0        | 4.0        |
| Minimum Recall               | No         |            | No    |       |            | No         |
| Maximum Recall               | Yes        |            | Yes   |       |            | Yes        |
| Pedestrian Recall            | No         |            | No    |       |            | No         |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0   | 0.0   | 0.0        | 0.0        |
| Detector Length [ft]         | 50.0       | 50.0       | 0.0   | 0.0   | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00  | 1.00  | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C     | C    |
|-----------------------------------------|------|------|-------|------|
| C, Cycle Length [s]                     | 120  | 120  | 120   | 120  |
| L, Total Lost Time per Cycle [s]        | 6.00 | 6.00 | 5.00  | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00  | 2.00 |
| l2, Clearance Lost Time [s]             | 4.00 | 4.00 | 3.00  | 4.00 |
| g_i, Effective Green Time [s]           | 83   | 83   | 26    | 83   |
| g / C, Green / Cycle                    | 0.69 | 0.69 | 0.22  | 0.69 |
| (v / s)_i Volume / Saturation Flow Rate | 0.28 | 0.28 | 0.04  | 0.19 |
| s, saturation flow rate [veh/h]         | 1863 | 1862 | 1723  | 1798 |
| c, Capacity [veh/h]                     | 1289 | 1288 | 373   | 1275 |
| d1, Uniform Delay [s]                   | 7.94 | 7.94 | 38.31 | 7.00 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50  | 0.50 |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00  | 1.00 |
| d2, Incremental Delay [s]               | 0.96 | 0.96 | 1.05  | 0.52 |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00  | 0.00 |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00  | 1.00 |
| PF, progression factor                  | 1.00 | 1.00 | 1.00  | 1.00 |

**Lane Group Results**

|                                       |        |        |       |        |
|---------------------------------------|--------|--------|-------|--------|
| X, volume / capacity                  | 0.41   | 0.41   | 0.18  | 0.27   |
| d, Delay for Lane Group [s/veh]       | 8.90   | 8.90   | 39.36 | 7.53   |
| Lane Group LOS                        | A      | A      | D     | A      |
| Critical Lane Group                   | No     | Yes    | Yes   | No     |
| 50th-Percentile Queue Length [veh/ln] | 5.75   | 5.75   | 1.74  | 3.22   |
| 50th-Percentile Queue Length [ft/ln]  | 143.67 | 143.74 | 43.60 | 80.52  |
| 95th-Percentile Queue Length [veh/ln] | 9.68   | 9.68   | 3.14  | 5.80   |
| 95th-Percentile Queue Length [ft/ln]  | 241.95 | 242.04 | 78.48 | 144.93 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |      |      |
|---------------------------------|-------|------|-------|-------|------|------|
| d_M, Delay for Movement [s/veh] | 8.90  | 8.90 | 39.36 | 39.36 | 7.53 | 7.53 |
| Movement LOS                    | A     | A    | D     | D     | A    | A    |
| d_A, Approach Delay [s/veh]     | 8.90  |      | 39.36 |       | 7.53 |      |
| Approach LOS                    | A     |      | D     |       | A    |      |
| d_I, Intersection Delay [s/veh] | 9.97  |      |       |       |      |      |
| Intersection LOS                | A     |      |       |       |      |      |
| Intersection V/C                | 0.347 |      |       |       |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 17: US 1/43rd Avenue

Control Type: Two-way stop  
 Analysis Method: HCM 6th Edition  
 Analysis Period: 15 minutes

Delay (sec / veh): 35.6  
 Level Of Service: E  
 Volume to Capacity (v/c): 0.047

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        |                                                                                     |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northeastbound                                                                    |        | Southwestbound                                                                     |        | Southeastbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 35.00                                                                             |        | 35.00                                                                              |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 112    | 331    | 895    | 57     | 6      | 85     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 112    | 331    | 895    | 57     | 6      | 85     |
| Peak Hour Factor                        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 28     | 83     | 224    | 14     | 2      | 21     |
| Total Analysis Volume [veh/h]           | 112    | 331    | 895    | 57     | 6      | 85     |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0      |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |      |      |       |       |
|---------------------------------------|-------|------|------|------|-------|-------|
| V/C, Movement V/C Ratio               | 0.16  | 0.00 | 0.01 | 0.00 | 0.05  | 0.16  |
| d_M, Delay for Movement [s/veh]       | 10.94 | 0.00 | 0.00 | 0.00 | 35.58 | 13.84 |
| Movement LOS                          | B     | A    | A    | A    | E     | B     |
| 95th-Percentile Queue Length [veh/ln] | 0.55  | 0.00 | 0.00 | 0.00 | 0.77  | 0.77  |
| 95th-Percentile Queue Length [ft/ln]  | 13.78 | 0.00 | 0.00 | 0.00 | 19.16 | 19.16 |
| d_A, Approach Delay [s/veh]           | 2.77  |      | 0.00 |      | 15.27 |       |
| Approach LOS                          | A     |      | A    |      | C     |       |
| d_I, Intersection Delay [s/veh]       | 1.76  |      |      |      |       |       |
| Intersection LOS                      | E     |      |      |      |       |       |



### Intersection Level Of Service Report

#### Intersection 18: US 1/42nd Place/Crittenden St

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 33.6  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.879 |

#### Intersection Setup

| Name                   | 42nd Pl                                                                           |        |        | Crittenden St                                                                     |        |        | US 1                                                                                |        |        | US 1                                                                                |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Southbound                                                                        |        |        | Eastbound                                                                         |        |        | Northeastbound                                                                      |        |        | Southwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Right  | Right2 | Left                                                                              | Thru   | Right  | Left2                                                                               | Left   | Thru   | Thru                                                                                | Right  | Right2 |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 150.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 25.00                                                                             |        |        | 25.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

#### Volumes

| Name                                    | 42nd Pl |        |        | Crittenden St |        |        | US 1   |        |        | US 1   |        |        |
|-----------------------------------------|---------|--------|--------|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 1       | 14     | 0      | 0             | 23     | 257    | 286    | 14     | 426    | 940    | 20     | 5      |
| Base Volume Adjustment Factor           | 1.0000  | 1.0000 | 1.0000 | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00    | 0.00   | 0.00   | 0.00          | 0.00   | 2.00   | 2.14   | 0.00   | 2.17   | 2.05   | 0.00   | 0.00   |
| Growth Rate                             | 1.00    | 1.00   | 1.00   | 1.00          | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0       | 0      | 0      | 0             | 0      | 12     | 3      | 0      | 0      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 1       | 14     | 0      | 0             | 23     | 269    | 289    | 14     | 426    | 940    | 20     | 5      |
| Peak Hour Factor                        | 0.9000  | 0.9000 | 0.9000 | 1.0000        | 0.9000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000  | 1.0000 | 1.0000 | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0       | 4      | 0      | 0             | 6      | 75     | 72     | 4      | 118    | 261    | 6      | 1      |
| Total Analysis Volume [veh/h]           | 1       | 16     | 0      | 0             | 26     | 299    | 289    | 16     | 473    | 1044   | 22     | 6      |
| Presence of On-Street Parking           | No      |        | No     | No            |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0       |        |        | 0             |        |        | 0      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0       |        |        | 0             |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 12.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Signal group                 | 4     | 4     | 4     | 0     | 3     | 3     | 0     | 6     | 6     | 2     | 6     | 6     |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |       |       |       |       |
| Lead / Lag                   | Lag   | -     | -     | -     | -     | -     | -     | Lag   | -     | -     | -     | -     |
| Minimum Green [s]            | 5     | 5     | 5     | 0     | 5     | 5     | 0     | 20    | 20    | 5     | 20    | 20    |
| Maximum Green [s]            | 19    | 19    | 19    | 0     | 25    | 25    | 0     | 60    | 60    | 30    | 60    | 60    |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 0.0   | 4.0   | 4.0   | 0.0   | 5.0   | 5.0   | 3.0   | 5.0   | 5.0   |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 0.0   | 1.0   | 1.0   | 0.0   | 4.0   | 4.0   | 1.0   | 4.0   | 4.0   |
| Split [s]                    | 24    | 24    | 24    | 0     | 30    | 30    | 0     | 66    | 66    | 66    | 66    | 66    |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Rest In Walk                 | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 0.0   | 7.0   | 7.0   | 2.0   | 7.0   | 7.0   |
| Minimum Recall               | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| Maximum Recall               | No    |       |       |       | No    |       |       |       | Yes   | No    |       |       |
| Pedestrian Recall            | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0  | 50.0  | 50.0  | 0.0   | 50.0  | 50.0  | 0.0   | 50.0  | 50.0  | 50.0  | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C     | C    | C    |
|-----------------------------------------|-------|-------|-------|-------|------|------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   | 120  | 120  |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 9.00  | 9.00  | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00 | 0.00 |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 7.00  | 7.00  | 2.00 | 2.00 |
| g_i, Effective Green Time [s]           | 2     | 25    | 74    | 74    | 79   | 79   |
| g / C, Green / Cycle                    | 0.02  | 0.21  | 0.62  | 0.62  | 0.66 | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01  | 0.20  | 0.58  | 0.13  | 0.29 | 0.29 |
| s, saturation flow rate [veh/h]         | 1625  | 1635  | 524   | 3541  | 1862 | 1845 |
| c, Capacity [veh/h]                     | 30    | 341   | 298   | 2177  | 1222 | 1211 |
| d1, Uniform Delay [s]                   | 58.41 | 46.94 | 38.27 | 10.28 | 9.95 | 9.98 |
| k, delay calibration                    | 0.11  | 0.38  | 0.50  | 0.50  | 0.50 | 0.50 |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |
| d2, Incremental Delay [s]               | 15.39 | 32.75 | 58.54 | 0.23  | 1.15 | 1.17 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |

**Lane Group Results**

|                                       |       |        |        |        |        |        |
|---------------------------------------|-------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.56  | 0.95   | 1.02   | 0.22   | 0.44   | 0.44   |
| d, Delay for Lane Group [s/veh]       | 73.79 | 79.70  | 96.81  | 10.51  | 11.09  | 11.16  |
| Lane Group LOS                        | E     | E      | F      | B      | B      | B      |
| Critical Lane Group                   | Yes   | Yes    | Yes    | No     | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 0.65  | 12.73  | 13.84  | 2.72   | 6.66   | 6.69   |
| 50th-Percentile Queue Length [ft/ln]  | 16.14 | 318.13 | 346.04 | 68.08  | 166.52 | 167.27 |
| 95th-Percentile Queue Length [veh/ln] | 1.16  | 18.58  | 20.32  | 4.90   | 10.89  | 10.93  |
| 95th-Percentile Queue Length [ft/ln]  | 29.05 | 464.39 | 508.03 | 122.54 | 272.34 | 273.32 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 73.79 | 73.79 | 73.79 | 0.00  | 79.70 | 79.70 | 96.81 | 96.81 | 10.51 | 11.12 | 11.16 | 11.16 |
| Movement LOS                    | E     | E     | E     |       | E     | E     | F     | F     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 73.79 |       |       | 79.70 |       |       | 44.34 |       |       | 11.12 |       |       |
| Approach LOS                    | E     |       |       | E     |       |       | D     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 33.57 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.879 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 19: US 1/41st Place/Charles Armentrout Drive

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 42.9  |
| Analysis Method: | HCM 2010   | Level Of Service:         | D     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.946 |

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Charles L Armentrout                                                                |        |        | 41st                                                                                |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 200.00                                                                            | 100.00 | 200.00 | 200.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 43.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Charles L Armentrout |        |        | 41st   |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|----------------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 3      | 233    | 207    | 409    | 825    | 1      | 644                  | 4      | 505    | 2      | 2      | 3      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.00   | 2.38   | 2.14   | 2.00   | 0.00   | 2.00                 | 0.00   | 2.21   | 0.00   | 0.00   | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00                 | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 12     | 0      | 0      | 0                    | 0      | 3      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 3      | 233    | 207    | 421    | 825    | 1      | 644                  | 4      | 508    | 2      | 2      | 3      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000               | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1      | 65     | 58     | 117    | 229    | 0      | 179                  | 1      | 141    | 1      | 1      | 1      |
| Total Analysis Volume [veh/h]           | 3      | 259    | 230    | 468    | 917    | 1      | 716                  | 4      | 564    | 2      | 2      | 3      |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No                   |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 4      |        |        | 0      |        |        | 0                    |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0                    |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 42.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Overlap | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 6       | 6       | 6       | 5        | 2       | 2       | 8       | 8       | 2       | 4       | 4       | 4       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |         |         | 2,5     |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 20      | 5        | 20      | 20      | 8       | 8       | 20      | 8       | 8       | 8       |
| Maximum Green [s]            | 25      | 25      | 25      | 18       | 48      | 48      | 60      | 60      | 48      | 60      | 60      | 60      |
| Amber [s]                    | 5.0     | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     | 4.0     | 4.0     | 5.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0     | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     | 2.0     | 2.0     | 1.0     | 2.0     | 2.0     | 2.0     |
| Split [s]                    | 31      | 31      | 31      | 23       | 54      | 54      | 66      | 66      | 54      | 66      | 66      | 66      |
| Vehicle Extension [s]        | 6.0     | 6.0     | 6.0     | 3.0      | 6.0     | 6.0     | 3.0     | 3.0     | 6.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |          | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0     | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| Minimum Recall               |         | No      |         | No       | No      |         |         | No      | No      |         | No      |         |
| Maximum Recall               |         | Yes     |         | No       | Yes     |         |         | No      | Yes     |         | No      |         |
| Pedestrian Recall            |         | No      |         | No       | No      |         |         | No      | No      |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 50.0    | 50.0    | 50.0    | 50.0     | 50.0    | 50.0    | 50.0    | 50.0    | 0.0     | 50.0    | 50.0    | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | C     | C     | R     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 5.50  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 2.00  | 0.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 4.00  | 4.00  | 4.00  | 0.00  | 4.00  | 4.00  | 4.00  | 0.00  | 4.00  |
| g_i, Effective Green Time [s]           | 25    | 25    | 25    | 48    | 48    | 48    | 60    | 48    | 60    |
| g / C, Green / Cycle                    | 0.21  | 0.21  | 0.21  | 0.40  | 0.40  | 0.40  | 0.50  | 0.40  | 0.50  |
| (v / s)_i Volume / Saturation Flow Rate | 0.00  | 0.07  | 0.15  | 0.33  | 0.25  | 0.25  | 0.50  | 0.36  | 0.00  |
| s, saturation flow rate [veh/h]         | 618   | 3547  | 1577  | 1402  | 1863  | 1862  | 1443  | 1580  | 1874  |
| c, Capacity [veh/h]                     | 60    | 739   | 329   | 581   | 745   | 745   | 782   | 632   | 975   |
| d1, Uniform Delay [s]                   | 60.00 | 40.57 | 44.02 | 31.47 | 28.66 | 28.66 | 29.70 | 33.59 | 15.06 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.45  | 0.50  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.57  | 1.31  | 11.75 | 11.34 | 3.79  | 3.80  | 16.51 | 17.38 | 0.00  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

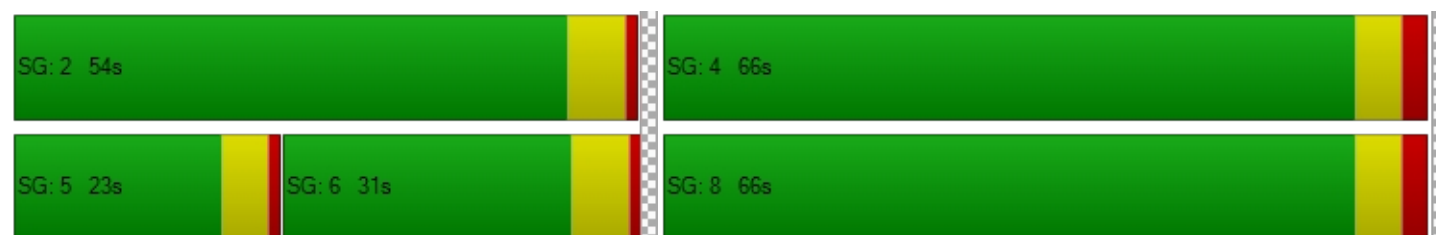
|                                       |       |        |        |        |        |        |        |        |       |
|---------------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.05  | 0.35   | 0.70   | 0.81   | 0.62   | 0.62   | 0.92   | 0.89   | 0.01  |
| d, Delay for Lane Group [s/veh]       | 61.57 | 41.88  | 55.77  | 42.81  | 32.46  | 32.46  | 46.22  | 50.97  | 15.06 |
| Lane Group LOS                        | E     | D      | E      | D      | C      | C      | D      | D      | B     |
| Critical Lane Group                   | No    | No     | Yes    | No     | No     | No     | Yes    | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.12  | 3.34   | 7.24   | 12.57  | 11.07  | 11.07  | 23.68  | 18.26  | 0.10  |
| 50th-Percentile Queue Length [ft/ln]  | 2.89  | 83.39  | 181.07 | 314.30 | 276.86 | 276.79 | 591.96 | 456.51 | 2.48  |
| 95th-Percentile Queue Length [veh/ln] | 0.21  | 6.00   | 11.66  | 18.39  | 16.53  | 16.53  | 31.66  | 25.27  | 0.18  |
| 95th-Percentile Queue Length [ft/ln]  | 5.21  | 150.10 | 291.41 | 459.68 | 413.30 | 413.21 | 791.47 | 631.72 | 4.47  |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 61.57 | 41.88 | 55.77 | 42.81 | 32.46 | 32.46 | 46.22 | 46.22 | 50.97 | 15.06 | 15.06 | 15.06 |
| Movement LOS                    | E     | D     | E     | D     | C     | C     | D     | D     | D     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 48.49 |       |       | 35.95 |       |       | 48.30 |       |       | 15.06 |       |       |
| Approach LOS                    | D     |       |       | D     |       |       | D     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 42.86 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.946 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 20: MD 410/Toledo Terrace

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 31.8  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.612

#### Intersection Setup

| Name                   |                                                                                   |        |        | Toledo Terrace                                                                    |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 500.00                                                                              | 100.00 | 900.00 | 175.00                                                                              | 100.00 | 175.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 50.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Toledo Terrace |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 93     | 5      | 80     | 167            | 22     | 235    | 135    | 683    | 153    | 71     | 1109   | 89     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.44   | 0.00   | 2.50   | 2.38           | 0.00   | 1.96   | 2.07   | 2.00   | 1.92   | 2.00   | 2.05   | 3.85   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00           | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 43     | 0      | 0      | 0              | 0      | 0      | 0      | 6      | 11     | 0      | 26     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 136    | 5      | 80     | 167            | 22     | 235    | 135    | 689    | 164    | 71     | 1135   | 89     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000         | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 38     | 1      | 22     | 46             | 6      | 65     | 38     | 191    | 46     | 20     | 315    | 25     |
| Total Analysis Volume [veh/h]           | 151    | 6      | 89     | 186            | 24     | 261    | 150    | 766    | 182    | 79     | 1261   | 99     |
| Presence of On-Street Parking           | No     |        | No     | No             |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 4      |        |        | 2              |        |        | 1      |        |        | 5      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0              |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 9.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|---------|---------|
| Signal group                 | 8       | 8       | 8       | 4       | 4       | 4       | 1        | 6       | 6       | 2       | 2       | 2       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lead     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 8       | 8       | 8       | 8       | 8       | 8       | 5        | 20      | 20      | 20      | 20      | 20      |
| Maximum Green [s]            | 36      | 36      | 36      | 36      | 36      | 36      | 25       | 102     | 102     | 72      | 72      | 72      |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0      | 4.5     | 4.5     | 4.5     | 4.5     | 4.5     |
| All red [s]                  | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 1.0      | 1.5     | 1.5     | 1.5     | 1.5     | 1.5     |
| Split [s]                    | 42      | 42      | 42      | 42      | 42      | 42      | 30       | 108     | 108     | 78      | 78      | 78      |
| Vehicle Extension [s]        | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0      | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         |         | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | Yes     |         |         | Yes     |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L      | C     | L     | C     | L     | C    | R    | L     | C     | R     |
|-----------------------------------------|--------|-------|-------|-------|-------|------|------|-------|-------|-------|
| C, Cycle Length [s]                     | 150    | 150   | 150   | 150   | 150   | 150  | 150  | 150   | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 6.00   | 6.00  | 6.00  | 6.00  | 6.00  | 6.00 | 6.00 | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00   | 0.00  | 2.00  | 0.00  | 0.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 4.00   | 4.00  | 4.00  | 4.00  | 0.00  | 4.00 | 4.00 | 4.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 36     | 36    | 36    | 36    | 102   | 102  | 102  | 90    | 90    | 90    |
| g / C, Green / Cycle                    | 0.24   | 0.24  | 0.24  | 0.24  | 0.68  | 0.68 | 0.68 | 0.60  | 0.60  | 0.60  |
| (v / s)_i Volume / Saturation Flow Rate | 0.14   | 0.06  | 0.14  | 0.17  | 0.26  | 0.22 | 0.12 | 0.11  | 0.36  | 0.06  |
| s, saturation flow rate [veh/h]         | 1085   | 1621  | 1285  | 1634  | 567   | 3547 | 1580 | 698   | 3545  | 1553  |
| c, Capacity [veh/h]                     | 120    | 389   | 279   | 392   | 357   | 2412 | 1074 | 394   | 2131  | 933   |
| d1, Uniform Delay [s]                   | 72.02  | 46.02 | 59.05 | 52.47 | 14.28 | 9.80 | 8.68 | 21.46 | 18.52 | 12.75 |
| k, delay calibration                    | 0.13   | 0.11  | 0.14  | 0.23  | 0.50  | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 133.01 | 0.32  | 3.59  | 5.36  | 3.59  | 0.35 | 0.34 | 1.14  | 1.22  | 0.23  |
| d3, Initial Queue Delay [s]             | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |       |        |       |       |        |       |
|---------------------------------------|--------|--------|--------|--------|-------|--------|-------|-------|--------|-------|
| X, volume / capacity                  | 1.26   | 0.24   | 0.67   | 0.73   | 0.42  | 0.32   | 0.17  | 0.20  | 0.59   | 0.11  |
| d, Delay for Lane Group [s/veh]       | 205.03 | 46.34  | 62.64  | 57.83  | 17.87 | 10.14  | 9.02  | 22.60 | 19.74  | 12.98 |
| Lane Group LOS                        | F      | D      | E      | E      | B     | B      | A     | C     | B      | B     |
| Critical Lane Group                   | No     | No     | No     | Yes    | Yes   | No     | No    | No    | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 9.08   | 2.94   | 7.09   | 10.52  | 1.92  | 4.78   | 2.06  | 1.68  | 13.12  | 1.44  |
| 50th-Percentile Queue Length [ft/ln]  | 226.90 | 73.49  | 177.17 | 263.00 | 48.00 | 119.42 | 51.61 | 41.88 | 327.93 | 35.95 |
| 95th-Percentile Queue Length [veh/ln] | 15.57  | 5.29   | 11.45  | 15.84  | 3.46  | 8.36   | 3.72  | 3.02  | 19.06  | 2.59  |
| 95th-Percentile Queue Length [ft/ln]  | 389.23 | 132.28 | 286.31 | 395.98 | 86.40 | 209.03 | 92.90 | 75.38 | 476.43 | 64.70 |

**Movement, Approach, & Intersection Results**

|                                 |        |       |       |       |       |       |       |       |      |       |       |       |
|---------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 205.03 | 46.34 | 46.34 | 62.64 | 57.83 | 57.83 | 17.87 | 10.14 | 9.02 | 22.60 | 19.74 | 12.98 |
| Movement LOS                    | F      | D     | D     | E     | E     | E     | B     | B     | A    | C     | B     | B     |
| d_A, Approach Delay [s/veh]     | 143.75 |       |       | 59.73 |       |       | 11.01 |       |      | 19.43 |       |       |
| Approach LOS                    | F      |       |       | E     |       |       | B     |       |      | B     |       |       |
| d_I, Intersection Delay [s/veh] | 31.82  |       |       |       |       |       |       |       |      |       |       |       |
| Intersection LOS                | C      |       |       |       |       |       |       |       |      |       |       |       |
| Intersection V/C                | 0.612  |       |       |       |       |       |       |       |      |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 21: MD 410/Editors Park Dr

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 5.2   |
| Analysis Method: | HCM 2010   | Level Of Service:         | A     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.418 |

#### Intersection Setup

| Name                   | Editors Park Dr                                                                   |        | MD 410                                                                             |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        | Eastbound                                                                          |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |  |        |  |        |        |
| Turning Movement       | Left                                                                              | Right  | Thru                                                                               | Right  | U-turn                                                                              | Left   | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 200.00 | 150.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 45.00                                                                              |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Editors Park Dr |        | MD 410 |        | MD 410 |        |        |
|-----------------------------------------|-----------------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 58              | 54     | 821    | 102    | 1      | 65     | 1280   |
| Base Volume Adjustment Factor           | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85            | 0.00   | 2.00   | 1.64   | 0.00   | 1.89   | 2.05   |
| Growth Rate                             | 1.00            | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0               | 86     | 6      | 0      | 0      | 21     | 26     |
| Diverted Trips [veh/h]                  | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 58              | 140    | 827    | 102    | 1      | 86     | 1306   |
| Peak Hour Factor                        | 0.9000          | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 16              | 39     | 230    | 28     | 0      | 24     | 363    |
| Total Analysis Volume [veh/h]           | 64              | 156    | 919    | 113    | 1      | 96     | 1451   |
| Presence of On-Street Parking           | No              | No     | No     | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0               |        | 0      |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0               |        | 0      |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
|------------------------------|------------|------------|------------|------------|------------|------------|------------|
| Signal group                 | 5          | 0          | 6          | 0          | 0          | 0          | 2          |
| Auxiliary Signal Groups      |            |            |            |            |            |            |            |
| Lead / Lag                   | Lead       | -          | -          | -          | -          | -          | -          |
| Minimum Green [s]            | 5          | 0          | 5          | 0          | 0          | 0          | 5          |
| Maximum Green [s]            | 30         | 0          | 30         | 0          | 0          | 0          | 30         |
| Amber [s]                    | 3.0        | 0.0        | 3.0        | 0.0        | 0.0        | 0.0        | 3.0        |
| All red [s]                  | 1.0        | 0.0        | 1.0        | 0.0        | 0.0        | 0.0        | 1.0        |
| Split [s]                    | 74         | 0          | 46         | 0          | 0          | 0          | 46         |
| Vehicle Extension [s]        | 3.0        | 0.0        | 3.0        | 0.0        | 0.0        | 0.0        | 3.0        |
| Walk [s]                     | 5          | 0          | 5          | 0          | 0          | 0          | 5          |
| Pedestrian Clearance [s]     | 10         | 0          | 10         | 0          | 0          | 0          | 10         |
| Rest In Walk                 | No         |            | No         |            |            |            | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 0.0        | 2.0        | 0.0        | 0.0        | 0.0        | 2.0        |
| I2, Clearance Lost Time [s]  | 2.0        | 0.0        | 2.0        | 0.0        | 0.0        | 0.0        | 2.0        |
| Minimum Recall               | No         |            | No         |            |            |            | No         |
| Maximum Recall               | No         |            | No         |            |            |            | No         |
| Pedestrian Recall            | No         |            | No         |            |            |            | No         |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Detector Length [ft]         | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C    | R    | L    | C    |
|-----------------------------------------|-------|------|------|------|------|
| C, Cycle Length [s]                     | 34    | 34   | 34   | 34   | 34   |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s]             | 2.00  | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s]           | 6     | 20   | 20   | 20   | 20   |
| g / C, Green / Cycle                    | 0.18  | 0.59 | 0.59 | 0.59 | 0.59 |
| (v / s)_i Volume / Saturation Flow Rate | 0.13  | 0.26 | 0.07 | 0.16 | 0.29 |
| s, saturation flow rate [veh/h]         | 1667  | 3547 | 1589 | 606  | 5072 |
| c, Capacity [veh/h]                     | 299   | 2070 | 927  | 446  | 2960 |
| d1, Uniform Delay [s]                   | 13.09 | 3.95 | 3.15 | 7.63 | 4.10 |
| k, delay calibration                    | 0.11  | 0.11 | 0.11 | 0.11 | 0.11 |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s]               | 3.52  | 0.15 | 0.06 | 0.24 | 0.13 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

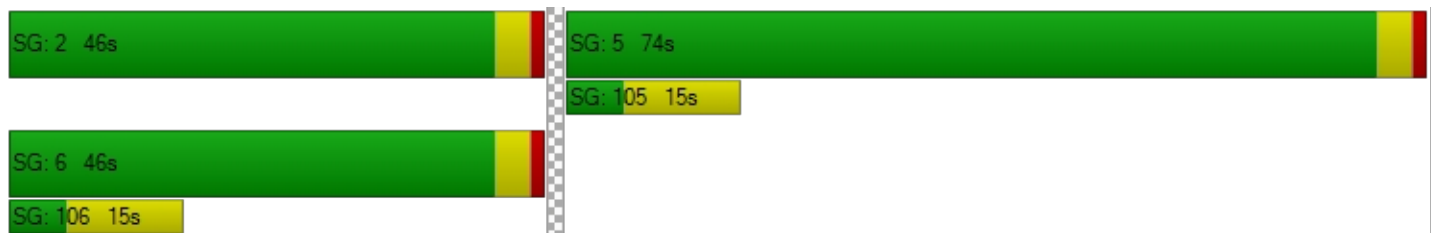
|                                       |       |       |      |       |       |
|---------------------------------------|-------|-------|------|-------|-------|
| X, volume / capacity                  | 0.74  | 0.44  | 0.12 | 0.22  | 0.49  |
| d, Delay for Lane Group [s/veh]       | 16.61 | 4.10  | 3.21 | 7.87  | 4.22  |
| Lane Group LOS                        | B     | A     | A    | A     | A     |
| Critical Lane Group                   | Yes   | No    | No   | No    | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 1.51  | 0.24  | 0.05 | 0.28  | 0.25  |
| 50th-Percentile Queue Length [ft/ln]  | 37.83 | 5.97  | 1.33 | 7.07  | 6.21  |
| 95th-Percentile Queue Length [veh/ln] | 2.72  | 0.43  | 0.10 | 0.51  | 0.45  |
| 95th-Percentile Queue Length [ft/ln]  | 68.10 | 10.75 | 2.40 | 12.73 | 11.18 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |      |      |      |      |
|---------------------------------|-------|-------|------|------|------|------|------|
| d_M, Delay for Movement [s/veh] | 16.61 | 16.61 | 4.10 | 3.21 | 7.87 | 7.87 | 4.22 |
| Movement LOS                    | B     | B     | A    | A    | A    | A    | A    |
| d_A, Approach Delay [s/veh]     | 16.61 |       | 4.00 |      | 4.45 |      |      |
| Approach LOS                    | B     |       | A    |      | A    |      |      |
| d_I, Intersection Delay [s/veh] | 5.24  |       |      |      |      |      |      |
| Intersection LOS                | A     |       |      |      |      |      |      |
| Intersection V/C                | 0.418 |       |      |      |      |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 2 | 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 22: MD 410/Prince George's Plaza

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 13.3  |
| Analysis Method: | HCM 2010   | Level Of Service:         | B     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.388 |

#### Intersection Setup

| Name                   | Metro                                                                             |        |        | PG Plaza                                                                          |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 2                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 250.00                                                                            | 100.00 | 250.00 | 225.00                                                                              | 100.00 | 100.00 | 325.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Metro  |        |        | PG Plaza |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 76     | 11     | 66     | 30       | 16     | 18     | 98     | 790    | 59     | 57     | 1244   | 39     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.54   | 3.85   | 2.22   | 0.00     | 0.00   | 3.85   | 2.22   | 2.07   | 1.74   | 2.21   | 2.00   | 3.85   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 92     | 0      | 0      | 47     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 76     | 11     | 66     | 30       | 16     | 18     | 98     | 882    | 59     | 57     | 1291   | 39     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 21     | 3      | 18     | 8        | 4      | 5      | 27     | 245    | 16     | 16     | 359    | 11     |
| Total Analysis Volume [veh/h]           | 84     | 12     | 73     | 33       | 18     | 20     | 109    | 980    | 66     | 63     | 1434   | 43     |
| Presence of On-Street Parking           | No     |        | No     | No       |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0        |        |        | 0      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0        |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 39.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 3     | 3     | 3     | 4     | 4     | 4     | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |          |         |         |          |         |         |
| Lead / Lag                   | Lag   | -     | -     | Lag   | -     | -     | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 5     | 5     | 5     | 5     | 5        | 20      | 20      | 5        | 20      | 20      |
| Maximum Green [s]            | 24    | 24    | 24    | 24    | 24    | 24    | 25       | 54      | 54      | 25       | 54      | 54      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   | 1.0      | 1.5     | 1.5     | 1.0      | 1.5     | 1.5     |
| Split [s]                    | 30    | 30    | 30    | 30    | 30    | 30    | 30       | 60      | 60      | 30       | 60      | 60      |
| Vehicle Extension [s]        | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5      | 5.0     | 5.0     | 2.5      | 5.0     | 5.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       | No    |       |       | No    |       |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.5   | 3.5   | 3.5   | 3.5   | 3.5   | 3.5   | 3.0      | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     |
| Minimum Recall               |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    |       |       | No    |       | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 294.0   | 294.0   | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 30.0  | 30.0  | 30.0  | 30.0     | 6.0     | 6.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C     | L     | C     | R     | L    | C    | C    | L    | C    | C    |
|-----------------------------------------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150   | 150   | 150  | 150  | 150  | 150  | 150  | 150  |
| L, Total Lost Time per Cycle [s]        | 5.50  | 5.50  | 5.50  | 5.50  | 5.50  | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s]             | 3.50  | 3.50  | 3.50  | 3.50  | 3.50  | 0.00 | 4.00 | 4.00 | 0.00 | 4.00 | 4.00 |
| g_i, Effective Green Time [s]           | 10    | 10    | 5     | 5     | 5     | 118  | 108  | 108  | 118  | 108  | 108  |
| g / C, Green / Cycle                    | 0.07  | 0.07  | 0.03  | 0.03  | 0.03  | 0.79 | 0.72 | 0.72 | 0.79 | 0.72 | 0.72 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02  | 0.05  | 0.01  | 0.01  | 0.01  | 0.24 | 0.20 | 0.20 | 0.10 | 0.27 | 0.27 |
| s, saturation flow rate [veh/h]         | 3461  | 1589  | 3514  | 1900  | 1555  | 451  | 3544 | 1802 | 616  | 3547 | 1835 |
| c, Capacity [veh/h]                     | 234   | 108   | 112   | 61    | 50    | 387  | 2561 | 1302 | 518  | 2555 | 1322 |
| d1, Uniform Delay [s]                   | 66.80 | 68.87 | 70.96 | 70.97 | 71.21 | 4.96 | 7.18 | 7.18 | 3.97 | 8.08 | 8.08 |
| k, delay calibration                    | 0.08  | 0.08  | 0.08  | 0.08  | 0.08  | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s]               | 0.69  | 9.18  | 1.07  | 2.01  | 3.89  | 1.81 | 0.26 | 0.51 | 0.48 | 0.43 | 0.84 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

|                                       |       |        |       |       |       |       |        |        |       |        |        |
|---------------------------------------|-------|--------|-------|-------|-------|-------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.36  | 0.79   | 0.29  | 0.30  | 0.40  | 0.28  | 0.27   | 0.27   | 0.12  | 0.38   | 0.38   |
| d, Delay for Lane Group [s/veh]       | 67.49 | 78.05  | 72.04 | 72.98 | 75.10 | 6.77  | 7.44   | 7.69   | 4.45  | 8.51   | 8.91   |
| Lane Group LOS                        | E     | E      | E     | E     | E     | A     | A      | A      | A     | A      | A      |
| Critical Lane Group                   | No    | Yes    | No    | No    | Yes   | Yes   | No     | No     | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 1.57  | 3.50   | 0.64  | 0.71  | 0.81  | 0.81  | 3.53   | 3.69   | 0.42  | 5.57   | 5.91   |
| 50th-Percentile Queue Length [ft/ln]  | 39.26 | 87.60  | 16.02 | 17.86 | 20.31 | 20.26 | 88.28  | 92.21  | 10.38 | 139.14 | 147.69 |
| 95th-Percentile Queue Length [veh/ln] | 2.83  | 6.31   | 1.15  | 1.29  | 1.46  | 1.46  | 6.36   | 6.64   | 0.75  | 9.43   | 9.89   |
| 95th-Percentile Queue Length [ft/ln]  | 70.66 | 157.68 | 28.83 | 32.15 | 36.56 | 36.46 | 158.91 | 165.97 | 18.69 | 235.86 | 247.34 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |      |      |      |      |      |      |
|---------------------------------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| d_M, Delay for Movement [s/veh] | 67.49 | 78.05 | 78.05 | 72.04 | 72.98 | 75.10 | 6.77 | 7.51 | 7.69 | 4.45 | 8.64 | 8.91 |
| Movement LOS                    | E     | E     | E     | E     | E     | E     | A    | A    | A    | A    | A    | A    |
| d_A, Approach Delay [s/veh]     | 72.80 |       |       | 73.14 |       |       | 7.45 |      |      | 8.48 |      |      |
| Approach LOS                    | E     |       |       | E     |       |       | A    |      |      | A    |      |      |
| d_I, Intersection Delay [s/veh] | 13.34 |       |       |       |       |       |      |      |      |      |      |      |
| Intersection LOS                | B     |       |       |       |       |       |      |      |      |      |      |      |
| Intersection V/C                | 0.388 |       |       |       |       |       |      |      |      |      |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 23: MD 410/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 41.4  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.686

#### Intersection Setup

| Name                   | Belcrest Road                                                                     |        |        | Belcrest Rd                                                                       |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 250.00                                                                            | 100.00 | 100.00 | 250.00                                                                            | 100.00 | 100.00 | 225.00                                                                              | 100.00 | 100.00 | 225.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Road |        |        | Belcrest Rd |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|---------------|--------|--------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 232           | 270    | 11     | 95          | 409    | 93     | 112    | 684    | 122    | 194    | 1021   | 62     |
| Base Volume Adjustment Factor           | 1.0000        | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.21          | 2.00   | 3.85   | 2.00        | 2.21   | 2.63   | 2.00   | 2.00   | 2.38   | 2.63   | 2.00   | 2.63   |
| Growth Rate                             | 1.00          | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 18            | 0      | 0      | 0           | 0      | 3      | 17     | 0      | 75     | 32     | 26     | 0      |
| Diverted Trips [veh/h]                  | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 250           | 270    | 11     | 95          | 409    | 96     | 129    | 684    | 197    | 226    | 1047   | 62     |
| Peak Hour Factor                        | 0.9000        | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000        | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 69            | 75     | 3      | 26          | 114    | 27     | 36     | 190    | 55     | 63     | 291    | 17     |
| Total Analysis Volume [veh/h]           | 278           | 300    | 12     | 106         | 454    | 107    | 143    | 760    | 219    | 251    | 1163   | 69     |
| Presence of On-Street Parking           | No            |        | No     | No          |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 26            |        |        | 10          |        |        | 91     |        |        | 71     |        |        |
| Bicycle Volume [bicycles/h]             | 0             |        |        | 0           |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 144.0                           |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap | Protecte | Permiss | Overlap |
|------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 7        | 4       | 4       | 3        | 8       | 3       | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |          |         |         |          |         |         |          |         | 6,7     |          |         | 2,3     |
| Lead / Lag                   | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5        | 5       | 5       | 5        | 5       | 5       | 5        | 20      | 20      | 5        | 20      | 20      |
| Maximum Green [s]            | 30       | 21      | 21      | 30       | 30      | 30      | 30       | 50      | 50      | 30       | 50      | 50      |
| Amber [s]                    | 3.0      | 4.0     | 4.0     | 3.0      | 3.0     | 3.0     | 3.0      | 4.5     | 4.5     | 3.0      | 4.5     | 4.5     |
| All red [s]                  | 1.0      | 2.0     | 2.0     | 1.0      | 1.0     | 1.0     | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 2.0     |
| Split [s]                    | 30       | 36      | 36      | 20       | 46      | 20      | 26       | 34      | 34      | 50       | 58      | 58      |
| Vehicle Extension [s]        | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Walk [s]                     | 0        | 0       | 0       | 0        | 5       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0        | 10      | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 2.0      | 4.0     | 4.0     | 2.0      | 2.0     | 2.0     | 2.0      | 4.5     | 4.5     | 2.0      | 4.5     | 4.5     |
| Minimum Recall               | No       | No      |         | No       | No      |         | No       | No      | No      | No       | No      | No      |
| Maximum Recall               | No       | No      |         | No       | No      |         | No       | Yes     | Yes     | No       | Yes     | Yes     |
| Pedestrian Recall            | No       | No      |         | No       | No      |         | No       | No      | No      | No       | No      | No      |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 30.0    | 30.0    | 5.0      | 5.0     | 5.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 6.00  | 6.00  | 4.00  | 4.00  | 4.00  | 4.00  | 6.50  | 4.00  | 4.00  | 6.50  | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 4.00  | 4.00  | 0.00  | 2.00  | 2.00  | 2.00  | 4.50  | 0.00  | 2.00  | 4.50  | 0.00  |
| g_i, Effective Green Time [s]           | 40    | 22    | 22    | 42    | 28    | 28    | 14    | 70    | 90    | 24    | 79    | 96    |
| g / C, Green / Cycle                    | 0.27  | 0.15  | 0.15  | 0.28  | 0.19  | 0.19  | 0.09  | 0.46  | 0.60  | 0.16  | 0.53  | 0.64  |
| (v / s)_i Volume / Saturation Flow Rate | 0.13  | 0.08  | 0.09  | 0.07  | 0.16  | 0.17  | 0.08  | 0.21  | 0.14  | 0.14  | 0.33  | 0.04  |
| s, saturation flow rate [veh/h]         | 2183  | 1863  | 1813  | 1538  | 1859  | 1619  | 1774  | 3547  | 1557  | 1763  | 3547  | 1566  |
| c, Capacity [veh/h]                     | 416   | 278   | 270   | 435   | 350   | 305   | 168   | 1642  | 935   | 277   | 1865  | 998   |
| d1, Uniform Delay [s]                   | 45.90 | 59.32 | 59.41 | 41.42 | 58.55 | 59.43 | 66.91 | 27.54 | 13.95 | 62.13 | 25.11 | 10.33 |
| k, delay calibration                    | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.50  | 0.50  | 0.11  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.86  | 1.80  | 1.92  | 0.29  | 4.97  | 9.39  | 11.42 | 0.94  | 0.59  | 10.68 | 1.59  | 0.13  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |        |        |        |        |        |        |       |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.67   | 0.56   | 0.57   | 0.24   | 0.83   | 0.89   | 0.85   | 0.46   | 0.23   | 0.90   | 0.62   | 0.07  |
| d, Delay for Lane Group [s/veh]       | 47.76  | 61.13  | 61.33  | 41.71  | 63.52  | 68.82  | 78.33  | 28.48  | 14.54  | 72.80  | 26.70  | 10.46 |
| Lane Group LOS                        | D      | E      | E      | D      | E      | E      | E      | C      | B      | E      | C      | B     |
| Critical Lane Group                   | No     | No     | No     | Yes    | No     | Yes    | Yes    | No     | No     | No     | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 4.28   | 5.72   | 5.67   | 3.11   | 11.08  | 10.91  | 5.85   | 9.30   | 3.49   | 10.06  | 14.40  | 0.87  |
| 50th-Percentile Queue Length [ft/ln]  | 106.91 | 142.99 | 141.73 | 77.75  | 276.88 | 272.83 | 146.22 | 232.59 | 87.24  | 251.48 | 360.02 | 21.74 |
| 95th-Percentile Queue Length [veh/ln] | 7.67   | 9.64   | 9.57   | 5.60   | 16.53  | 16.33  | 9.82   | 14.31  | 6.28   | 15.26  | 20.62  | 1.57  |
| 95th-Percentile Queue Length [ft/ln]  | 191.70 | 241.05 | 239.35 | 139.95 | 413.32 | 408.27 | 245.38 | 357.64 | 157.03 | 381.51 | 515.61 | 39.14 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 47.76 | 61.22 | 61.33 | 41.71 | 65.45 | 68.82 | 78.33 | 28.48 | 14.54 | 72.80 | 26.70 | 10.46 |
| Movement LOS                    | D     | E     | E     | D     | E     | E     | E     | C     | B     | E     | C     | B     |
| d_A, Approach Delay [s/veh]     | 54.88 |       |       | 62.22 |       |       | 32.11 |       |       | 33.75 |       |       |
| Approach LOS                    | D     |       |       | E     |       |       | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 41.42 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.686 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 24: MD 410/MD 500/Adelphi Rd

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 46.4  |
| Analysis Method: | HCM 2010   | Level Of Service:         | D     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.850 |

#### Intersection Setup

| Name                   | MD 500                                                                            |        |        | Adelphi Rd                                                                        |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 350.00                                                                            | 100.00 | 150.00 | 300.00                                                                              | 100.00 | 100.00 | 350.00                                                                              | 100.00 | 150.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 45.00                                                                             |        |        | 45.00                                                                               |        |        | 50.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | MD 500 |        |        | Adelphi Rd |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 6      | 468    | 376    | 352        | 541    | 30     | 43     | 779    | 13     | 582    | 1233   | 526    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85   | 2.13   | 2.15   | 2.00       | 2.00   | 1.56   | 2.63   | 2.00   | 0.00   | 2.00   | 2.04   | 2.09   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 8      | 12     | 0      | 0          | 3      | 2      | 0      | 0      | 0      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 14     | 480    | 376    | 352        | 544    | 32     | 43     | 779    | 13     | 582    | 1233   | 526    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4      | 133    | 104    | 98         | 151    | 9      | 12     | 216    | 4      | 162    | 343    | 146    |
| Total Analysis Volume [veh/h]           | 16     | 533    | 418    | 391        | 604    | 36     | 48     | 866    | 14     | 647    | 1370   | 584    |
| Presence of On-Street Parking           | No     |        | No     | No         |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 3      |        |        | 6          |        |        | 5      |        |        | 9      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0          |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Unsigna | Protecte | Permiss | Overlap |
|------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 3        | 8       | 0       | 7        | 4       | 0       | 1        | 6       | 0       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |          |         |         |          |         |         |          |         |         |          |         | 2,4     |
| Lead / Lag                   | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5        | 5       | 0       | 5        | 7       | 0       | 5        | 25      | 0       | 5        | 5       | 5       |
| Maximum Green [s]            | 30       | 30      | 0       | 30       | 23      | 0       | 9        | 30      | 0       | 44       | 30      | 30      |
| Amber [s]                    | 3.0      | 3.0     | 0.0     | 3.0      | 5.0     | 0.0     | 4.0      | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     |
| All red [s]                  | 1.0      | 1.0     | 0.0     | 1.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     |
| Split [s]                    | 10       | 33      | 0       | 30       | 53      | 0       | 15       | 37      | 0       | 50       | 72      | 72      |
| Vehicle Extension [s]        | 3.0      | 3.0     | 0.0     | 3.0      | 2.5     | 0.0     | 3.0      | 5.0     | 0.0     | 6.0      | 3.0     | 3.0     |
| Walk [s]                     | 0        | 5       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 5       | 5       |
| Pedestrian Clearance [s]     | 0        | 10      | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 10      | 10      |
| Rest In Walk                 |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 2.0      | 2.0     | 0.0     | 2.0      | 5.0     | 0.0     | 4.0      | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     |
| Minimum Recall               | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      | No      |
| Maximum Recall               | No       | No      |         | No       | No      |         | No       | Yes     |         | No       | No      | No      |
| Pedestrian Recall            | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      | No      |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 294.0   | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 6.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | L     | C     | R    |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150  |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00  | 4.00  | 4.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 |
| l2, Clearance Lost Time [s]             | 2.00  | 2.00  | 2.00  | 2.00  | 5.00  | 5.00  | 0.00  | 5.00  | 0.00  | 5.00  | 0.00 |
| g_i, Effective Green Time [s]           | 2     | 36    | 36    | 19    | 50    | 50    | 80    | 54    | 80    | 70    | 133  |
| g / C, Green / Cycle                    | 0.02  | 0.24  | 0.24  | 0.13  | 0.33  | 0.33  | 0.53  | 0.36  | 0.53  | 0.46  | 0.88 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01  | 0.15  | 0.27  | 0.11  | 0.17  | 0.02  | 0.09  | 0.24  | 0.34  | 0.39  | 0.37 |
| s, saturation flow rate [veh/h]         | 1743  | 3542  | 1563  | 3445  | 3547  | 1583  | 535   | 3547  | 1899  | 3545  | 1579 |
| c, Capacity [veh/h]                     | 28    | 839   | 370   | 446   | 1170  | 522   | 226   | 1278  | 854   | 1648  | 1396 |
| d1, Uniform Delay [s]                   | 73.25 | 51.43 | 57.24 | 64.11 | 40.59 | 34.46 | 26.35 | 40.61 | 26.46 | 34.99 | 1.59 |
| k, delay calibration                    | 0.11  | 0.11  | 0.50  | 0.11  | 0.08  | 0.08  | 0.50  | 0.50  | 0.29  | 0.37  | 0.50 |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 |
| d2, Incremental Delay [s]               | 16.28 | 0.80  | 86.81 | 5.62  | 0.26  | 0.04  | 2.14  | 2.91  | 3.67  | 3.74  | 0.92 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 |

**Lane Group Results**

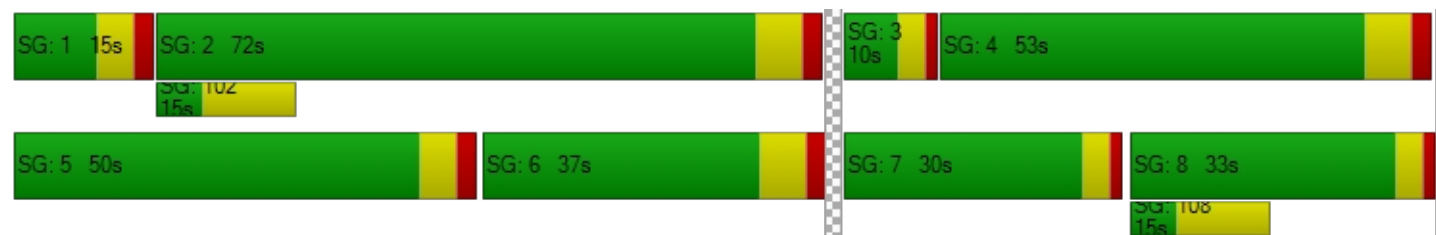
|                                       |       |        |        |        |        |       |       |        |        |        |       |
|---------------------------------------|-------|--------|--------|--------|--------|-------|-------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.56  | 0.64   | 1.13   | 0.88   | 0.52   | 0.07  | 0.21  | 0.68   | 0.76   | 0.83   | 0.42  |
| d, Delay for Lane Group [s/veh]       | 89.53 | 52.24  | 144.05 | 69.74  | 40.85  | 34.50 | 28.49 | 43.52  | 30.13  | 38.74  | 2.51  |
| Lane Group LOS                        | F     | D      | F      | E      | D      | C     | C     | D      | C      | D      | A     |
| Critical Lane Group                   | No    | No     | Yes    | Yes    | No     | No    | Yes   | No     | No     | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.73  | 8.95   | 22.61  | 7.56   | 8.90   | 0.90  | 0.92  | 13.75  | 6.67   | 21.52  | 1.30  |
| 50th-Percentile Queue Length [ft/ln]  | 18.32 | 223.72 | 565.21 | 189.03 | 222.60 | 22.57 | 22.93 | 343.85 | 166.64 | 538.05 | 32.58 |
| 95th-Percentile Queue Length [veh/ln] | 1.32  | 13.86  | 32.58  | 12.07  | 13.80  | 1.62  | 1.65  | 19.84  | 10.90  | 29.13  | 2.35  |
| 95th-Percentile Queue Length [ft/ln]  | 32.98 | 346.38 | 814.38 | 301.77 | 344.94 | 40.62 | 41.28 | 495.90 | 272.49 | 728.25 | 58.65 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |        |       |       |       |       |       |      |       |       |      |
|---------------------------------|-------|-------|--------|-------|-------|-------|-------|-------|------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 89.53 | 52.24 | 144.05 | 69.74 | 40.85 | 34.50 | 28.49 | 43.52 | 0.00 | 30.13 | 38.74 | 2.51 |
| Movement LOS                    | F     | D     | F      | E     | D     | C     | C     | D     |      | C     | D     | A    |
| d_A, Approach Delay [s/veh]     | 92.54 |       |        | 51.59 |       |       | 42.73 |       |      | 28.46 |       |      |
| Approach LOS                    | F     |       |        | D     |       |       | D     |       |      | C     |       |      |
| d_I, Intersection Delay [s/veh] | 46.39 |       |        |       |       |       |       |       |      |       |       |      |
| Intersection LOS                | D     |       |        |       |       |       |       |       |      |       |       |      |
| Intersection V/C                | 0.850 |       |        |       |       |       |       |       |      |       |       |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 25: Ager Rd/23rd Ave

Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutes

Delay (sec / veh): 35.9  
Level Of Service: D  
Volume to Capacity (v/c): 0.579

#### Intersection Setup

| Name                   | Rittenhouse St                                                                    |        |        | 23rd Ave                                                                          |        |        | Ager Rd.                                                                            |        |        | Ager Rd.                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present           | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                        | Rittenhouse St |        |        | 23rd Ave |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|---------------------------------------------|----------------|--------|--------|----------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]                   | 14             | 18     | 22     | 267      | 13     | 75     | 19       | 875    | 164    | 11       | 465    | 3      |
| Base Volume Adjustment Factor               | 1.0000         | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00           | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   |
| Growth Rate                                 | 1.00           | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]                   | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 47     | 0      | 0        | 14     | 0      |
| Diverted Trips [veh/h]                      | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                        | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]            | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]                 | 14             | 18     | 22     | 267      | 13     | 75     | 19       | 922    | 164    | 11       | 479    | 3      |
| Peak Hour Factor                            | 1.0000         | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Other Adjustment Factor                     | 1.0000         | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 4              | 5      | 6      | 67       | 3      | 19     | 5        | 231    | 41     | 3        | 120    | 1      |
| Total Analysis Volume [veh/h]               | 14             | 18     | 22     | 267      | 13     | 75     | 19       | 922    | 164    | 11       | 479    | 3      |
| Presence of On-Street Parking               | No             |        | No     | No       |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]                 | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | Yes                             |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 0       | 8       | 0       | 0       | 4       | 0       | 0       | 2       | 0       | 0       | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       |
| Minimum Green [s]            | 0       | 6       | 0       | 0       | 6       | 0       | 0       | 35      | 0       | 0       | 35      | 0       |
| Maximum Green [s]            | 0       | 20      | 0       | 0       | 30      | 0       | 0       | 35      | 0       | 0       | 35      | 0       |
| Amber [s]                    | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 0       | 25      | 0       | 0       | 30      | 0       | 0       | 39      | 0       | 0       | 39      | 0       |
| Vehicle Extension [s]        | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 7       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 21      | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 2.00  | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 0.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 20    | 25    | 35    | 35    | 35    | 35    | 35    | 35    |
| g / C, Green / Cycle                    | 0.22  | 0.28  | 0.39  | 0.39  | 0.39  | 0.39  | 0.39  | 0.39  |
| (v / s)_i Volume / Saturation Flow Rate | 0.03  | 0.25  | 0.02  | 0.33  | 0.33  | 0.02  | 0.14  | 0.14  |
| s, saturation flow rate [veh/h]         | 1557  | 1392  | 822   | 1683  | 1596  | 467   | 1683  | 1679  |
| c, Capacity [veh/h]                     | 396   | 422   | 297   | 654   | 621   | 110   | 654   | 653   |
| d1, Uniform Delay [s]                   | 28.19 | 31.02 | 24.93 | 25.12 | 25.14 | 40.39 | 19.62 | 19.62 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.71  | 18.04 | 0.41  | 13.16 | 13.84 | 1.82  | 1.60  | 1.60  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |       |        |        |       |        |        |
|---------------------------------------|-------|--------|-------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.14  | 0.84   | 0.06  | 0.85   | 0.85   | 0.10  | 0.37   | 0.37   |
| d, Delay for Lane Group [s/veh]       | 28.91 | 49.06  | 25.34 | 38.29  | 38.98  | 42.21 | 21.21  | 21.22  |
| Lane Group LOS                        | C     | D      | C     | D      | D      | D     | C      | C      |
| Critical Lane Group                   | No    | Yes    | No    | No     | Yes    | No    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 1.00  | 9.08   | 0.33  | 12.53  | 12.01  | 0.28  | 3.72   | 3.71   |
| 50th-Percentile Queue Length [ft/ln]  | 25.12 | 226.98 | 8.28  | 313.20 | 300.22 | 7.10  | 92.90  | 92.77  |
| 95th-Percentile Queue Length [veh/ln] | 1.81  | 14.02  | 0.60  | 18.33  | 17.69  | 0.51  | 6.69   | 6.68   |
| 95th-Percentile Queue Length [ft/ln]  | 45.22 | 350.52 | 14.91 | 458.32 | 442.30 | 12.78 | 167.21 | 166.98 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 28.91 | 28.91 | 28.91 | 49.06 | 49.06 | 49.06 | 25.34 | 38.56 | 38.98 | 42.21 | 21.22 | 21.22 |
| Movement LOS                    | C     | C     | C     | D     | D     | D     | C     | D     | D     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 28.91 |       |       | 49.06 |       |       | 38.39 |       |       | 21.68 |       |       |
| Approach LOS                    | C     |       |       | D     |       |       | D     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 35.92 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.579 |       |       |       |       |       |       |       |       |       |       |       |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 34.0  |  |  | 34.0  |  |  | 20.0  |  |  | 11.0  |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 17.42 |  |  | 17.42 |  |  | 27.22 |  |  | 34.67 |  |  |
| I_p,int, Pedestrian LOS Score for Intersection           | 1.757 |  |  | 1.970 |  |  | 3.181 |  |  | 2.661 |  |  |
| Crosswalk LOS                                            | A     |  |  | A     |  |  | C     |  |  | B     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 444   |  |  | 556   |  |  | 778   |  |  | 778   |  |  |
| d_b, Bicycle Delay [s]                                   | 27.22 |  |  | 23.47 |  |  | 16.81 |  |  | 16.81 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 1.649 |  |  | 2.145 |  |  | 2.471 |  |  | 1.966 |  |  |
| Bicycle LOS                                              | A     |  |  | B     |  |  | B     |  |  | A     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 26: Ager Rd/Oglethorpe St/School

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 39.2  |
| Analysis Method: | HCM 6th Edition | Level Of Service:         | D     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.420 |

#### Intersection Setup

| Name                   | Oglethorpe St                                                                     |        |        | School                                                                            |        |        | Ager Rd.                                                                            |        |         | Ager Rd.                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|---------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |         | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |         |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right   | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00   | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1       | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 1200.00 | 350.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 35.00                                                                               |        |         | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |         | 0.00                                                                                |        |        |
| Curb Present           | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |         | No                                                                                  |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |         | Yes                                                                                 |        |        |

#### Volumes

| Name                                        | Oglethorpe St |        |        | School |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|---------------------------------------------|---------------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]                   | 27            | 12     | 36     | 14     | 0      | 4      | 25       | 936    | 80     | 122      | 718    | 12     |
| Base Volume Adjustment Factor               | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00          | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   |
| Growth Rate                                 | 1.00          | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]                   | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 47     | 0      | 0        | 14     | 0      |
| Diverted Trips [veh/h]                      | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                        | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]            | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]                 | 27            | 12     | 36     | 14     | 0      | 4      | 25       | 983    | 80     | 122      | 732    | 12     |
| Peak Hour Factor                            | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Other Adjustment Factor                     | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 7             | 3      | 9      | 4      | 0      | 1      | 6        | 246    | 20     | 31       | 183    | 3      |
| Total Analysis Volume [veh/h]               | 27            | 12     | 36     | 14     | 0      | 4      | 25       | 983    | 80     | 122      | 732    | 12     |
| Presence of On-Street Parking               | No            |        | No     | No     |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]                 | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | Yes                             |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 0       | 8       | 0       | 5        | 2       | 0       | 1        | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |          |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 0       | 5       | 0       | 5        | 10      | 0       | 5        | 10      | 0       |
| Maximum Green [s]            | 0       | 20      | 0       | 0       | 20      | 0       | 20       | 30      | 0       | 20       | 30      | 0       |
| Amber [s]                    | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 4.0      | 4.0     | 0.0     | 4.0      | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     |
| Split [s]                    | 0       | 30      | 0       | 0       | 30      | 0       | 30       | 45      | 0       | 30       | 45      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 6.0     | 0.0     | 3.0      | 6.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 27      | 0       | 0        | 11      | 0       | 0        | 12      | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | L    | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 109   | 109   | 109  | 109   | 109   | 109   | 109   | 109   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 2.00  | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 0.00 | 3.00  | 3.00  | 0.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 25    | 25    | 70   | 40    | 40    | 70    | 40    | 40    |
| g / C, Green / Cycle                    | 0.23  | 0.23  | 0.64 | 0.37  | 0.37  | 0.64  | 0.37  | 0.37  |
| (v / s)_i Volume / Saturation Flow Rate | 0.05  | 0.01  | 0.02 | 0.32  | 0.32  | 0.13  | 0.22  | 0.22  |
| s, saturation flow rate [veh/h]         | 1422  | 1272  | 1028 | 1683  | 1639  | 928   | 1683  | 1673  |
| c, Capacity [veh/h]                     | 371   | 350   | 639  | 618   | 601   | 549   | 618   | 614   |
| d1, Uniform Delay [s]                   | 34.02 | 32.75 | 8.93 | 32.11 | 32.12 | 14.02 | 28.06 | 28.06 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50 | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.22  | 0.28  | 0.11 | 15.61 | 15.98 | 0.93  | 4.34  | 4.36  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |       |      |        |        |       |        |        |
|---------------------------------------|-------|-------|------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.20  | 0.05  | 0.04 | 0.87   | 0.87   | 0.22  | 0.60   | 0.60   |
| d, Delay for Lane Group [s/veh]       | 35.24 | 33.02 | 9.05 | 47.72  | 48.10  | 14.95 | 32.40  | 32.42  |
| Lane Group LOS                        | D     | C     | A    | D      | D      | B     | C      | C      |
| Critical Lane Group                   | Yes   | No    | No   | No     | Yes    | Yes   | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 1.74  | 0.40  | 0.22 | 15.39  | 15.06  | 1.16  | 8.44   | 8.40   |
| 50th-Percentile Queue Length [ft/ln]  | 43.46 | 9.99  | 5.41 | 384.75 | 376.40 | 29.06 | 211.00 | 209.92 |
| 95th-Percentile Queue Length [veh/ln] | 3.13  | 0.72  | 0.39 | 21.82  | 21.42  | 2.09  | 13.20  | 13.15  |
| 95th-Percentile Queue Length [ft/ln]  | 78.22 | 17.98 | 9.74 | 545.60 | 535.49 | 52.30 | 330.11 | 328.73 |

**Movement, Approach, & Intersection Results**

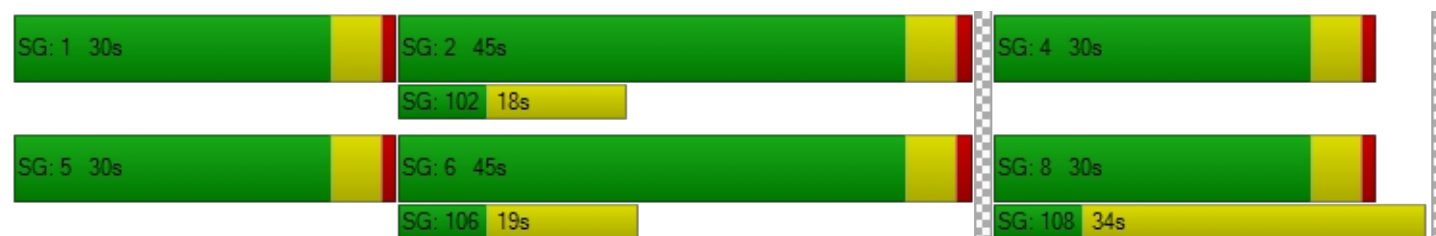
|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 35.24 | 35.24 | 35.24 | 33.02 | 33.02 | 33.02 | 9.05  | 47.89 | 48.10 | 14.95 | 32.41 | 32.42 |
| Movement LOS                    | D     | D     | D     | C     | C     | C     | A     | D     | D     | B     | C     | C     |
| d_A, Approach Delay [s/veh]     | 35.24 |       |       | 33.02 |       |       | 47.01 |       |       | 29.95 |       |       |
| Approach LOS                    | D     |       |       | C     |       |       | D     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 39.24 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.420 |       |       |       |       |       |       |       |       |       |       |       |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 11.0  |  |  | 11.0  |  |  | 25.0  |  |  | 11.0  |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 34.67 |  |  | 34.67 |  |  | 23.47 |  |  | 34.67 |  |  |
| I_p,int, Pedestrian LOS Score for Intersection           | 1.783 |  |  | 1.894 |  |  | 2.729 |  |  | 2.765 |  |  |
| Crosswalk LOS                                            | A     |  |  | A     |  |  | B     |  |  | C     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 556   |  |  | 556   |  |  | 889   |  |  | 889   |  |  |
| d_b, Bicycle Delay [s]                                   | 23.47 |  |  | 23.47 |  |  | 13.89 |  |  | 13.89 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 1.683 |  |  | 1.589 |  |  | 2.457 |  |  | 2.274 |  |  |
| Bicycle LOS                                              | A     |  |  | A     |  |  | B     |  |  | B     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report Intersection 27: Ager Rd/Nicholson St

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 16.3  
Level Of Service: B  
Volume to Capacity (v/c): 0.465

#### Intersection Setup

| Name                   | Ager Rd.                                                                          |       |       |       | Nicholson St                                                                      |        |        | Nicholson St                                                                        |        |        | Ager Rd.                                                                            |       |       |       |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|
| Approach               | Northbound                                                                        |       |       |       | Northeastbound                                                                    |        |        | Southwestbound                                                                      |        |        | Southeastbound                                                                      |       |       |       |
| Lane Configuration     |  |       |       |       |  |        |        |  |        |        |  |       |       |       |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 1     | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 1                                                                                   | 0     | 0     | 0     |
| Pocket Length [ft]     | 225.0                                                                             | 100.0 | 100.0 | 150.0 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 200.0                                                                               | 100.0 | 100.0 | 100.0 |
| Speed [mph]            | 35.00                                                                             |       |       |       | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 35.00                                                                               |       |       |       |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |       |       |       |
| Crosswalk              | Yes                                                                               |       |       |       | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |       |       |       |

#### Volumes

| Name                                    | Ager Rd. |       |       |       | Nicholson St |        |        | Nicholson St |        |        | Ager Rd. |       |       |       |
|-----------------------------------------|----------|-------|-------|-------|--------------|--------|--------|--------------|--------|--------|----------|-------|-------|-------|
| Base Volume Input [veh/h]               | 1        | 39    | 741   | 25    | 98           | 17     | 82     | 60           | 18     | 239    | 6        | 51    | 713   | 82    |
| Base Volume Adjustment Factor           | 1.000    | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000    | 1.000 | 1.000 | 1.000 |
| Heavy Vehicles Percentage [%]           | 0.00     | 0.00  | 2.00  | 0.00  | 2.00         | 0.00   | 1.82   | 0.00         | 0.00   | 1.74   | 0.00     | 2.44  | 2.00  | 3.57  |
| Growth Rate                             | 1.00     | 1.00  | 1.00  | 1.00  | 1.00         | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00     | 1.00  | 1.00  | 1.00  |
| In-Process Volume [veh/h]               | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Site-Generated Trips [veh/h]            | 0        | 0     | 47    | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 14    | 0     |
| Diverted Trips [veh/h]                  | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Pass-by Trips [veh/h]                   | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Existing Site Adjustment Volume [veh/h] | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Other Volume [veh/h]                    | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Right-Turn on Red Volume [veh/h]        | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Total Hourly Volume [veh/h]             | 1        | 39    | 788   | 25    | 98           | 17     | 82     | 60           | 18     | 239    | 6        | 51    | 727   | 82    |
| Peak Hour Factor                        | 0.900    | 0.900 | 0.900 | 0.900 | 0.9000       | 0.9000 | 0.9000 | 0.9000       | 0.9000 | 0.9000 | 0.900    | 0.900 | 0.900 | 0.900 |
| Other Adjustment Factor                 | 1.000    | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000    | 1.000 | 1.000 | 1.000 |
| Total 15-Minute Volume [veh/h]          | 0        | 11    | 219   | 7     | 27           | 5      | 23     | 17           | 5      | 66     | 2        | 14    | 202   | 23    |
| Total Analysis Volume [veh/h]           | 1        | 43    | 876   | 28    | 109          | 19     | 91     | 67           | 20     | 266    | 7        | 57    | 808   | 91    |
| Presence of On-Street Parking           | No       |       |       | No    | No           |        | No     | No           |        | No     | No       |       |       | No    |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Local Bus Stopping Rate [/h]            | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Pedestrian Volume [ped/h]               | 0        |       |       |       | 0            |        |        | 0            |        |        | 0        |       |       |       |
| Bicycle Volume [bicycles/h]             | 0        |       |       |       | 0            |        |        | 0            |        |        | 0        |       |       |       |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permi | Permi | Permi | Permi | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permi | Permi | Permi | Permi |
|------------------------------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|-------|-------|-------|-------|
| Signal group                 | 0     | 0     | 2     | 0     | 0       | 8       | 0       | 0       | 4       | 0       | 0     | 0     | 6     | 0     |
| Auxiliary Signal Groups      |       |       |       |       |         |         |         |         |         |         |       |       |       |       |
| Lead / Lag                   | -     | -     | -     | -     | -       | -       | -       | -       | -       | -       | -     | -     | -     | -     |
| Minimum Green [s]            | 0     | 0     | 5     | 0     | 0       | 5       | 0       | 0       | 5       | 0       | 0     | 0     | 5     | 0     |
| Maximum Green [s]            | 0     | 0     | 30    | 0     | 0       | 30      | 0       | 0       | 30      | 0       | 0     | 0     | 30    | 0     |
| Amber [s]                    | 0.0   | 0.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0   | 0.0   | 3.0   | 0.0   |
| All red [s]                  | 0.0   | 0.0   | 1.0   | 0.0   | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0   | 0.0   | 1.0   | 0.0   |
| Split [s]                    | 0     | 0     | 57    | 0     | 0       | 33      | 0       | 0       | 33      | 0       | 0     | 0     | 57    | 0     |
| Vehicle Extension [s]        | 0.0   | 0.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0   | 0.0   | 3.0   | 0.0   |
| Walk [s]                     | 0     | 0     | 5     | 0     | 0       | 5       | 0       | 0       | 5       | 0       | 0     | 0     | 5     | 0     |
| Pedestrian Clearance [s]     | 0     | 0     | 10    | 0     | 0       | 10      | 0       | 0       | 10      | 0       | 0     | 0     | 10    | 0     |
| Rest In Walk                 |       |       | No    |       |         | No      |         |         | No      |         |       |       | No    |       |
| I1, Start-Up Lost Time [s]   | 0.0   | 0.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0   | 0.0   | 2.0   | 0.0   |
| I2, Clearance Lost Time [s]  | 0.0   | 0.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0   | 0.0   | 2.0   | 0.0   |
| Minimum Recall               |       |       | No    |       |         | No      |         |         | No      |         |       |       | No    |       |
| Maximum Recall               |       |       | No    |       |         | No      |         |         | No      |         |       |       | No    |       |
| Pedestrian Recall            |       |       | No    |       |         | No      |         |         | No      |         |       |       | No    |       |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 0.00  | 2.00  | 2.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  |
| g_i, Effective Green Time [s]           | 53    | 53    | 53    | 29    | 29    | 53    | 53    | 53    |
| g / C, Green / Cycle                    | 0.59  | 0.59  | 0.59  | 0.32  | 0.32  | 0.59  | 0.59  | 0.59  |
| (v / s)_i Volume / Saturation Flow Rate | 0.07  | 0.24  | 0.24  | 0.22  | 0.22  | 0.10  | 0.25  | 0.25  |
| s, saturation flow rate [veh/h]         | 629   | 1863  | 1842  | 1000  | 1607  | 613   | 1863  | 1797  |
| c, Capacity [veh/h]                     | 352   | 1097  | 1085  | 382   | 565   | 346   | 1097  | 1058  |
| d1, Uniform Delay [s]                   | 15.56 | 10.06 | 10.06 | 27.18 | 26.30 | 16.10 | 10.08 | 10.08 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.73  | 1.16  | 1.17  | 6.12  | 5.13  | 1.18  | 1.17  | 1.21  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |        |       |        |        |
|---------------------------------------|-------|--------|--------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.12  | 0.41   | 0.41   | 0.57   | 0.62   | 0.18  | 0.42   | 0.42   |
| d, Delay for Lane Group [s/veh]       | 16.29 | 11.22  | 11.23  | 33.31  | 31.44  | 17.27 | 11.25  | 11.29  |
| Lane Group LOS                        | B     | B      | B      | C      | C      | B     | B      | B      |
| Critical Lane Group                   | No    | No     | No     | No     | Yes    | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 0.59  | 4.66   | 4.61   | 4.84   | 7.14   | 0.90  | 4.70   | 4.55   |
| 50th-Percentile Queue Length [ft/ln]  | 14.87 | 116.51 | 115.34 | 120.99 | 178.38 | 22.55 | 117.57 | 113.76 |
| 95th-Percentile Queue Length [veh/ln] | 1.07  | 8.20   | 8.14   | 8.45   | 11.52  | 1.62  | 8.26   | 8.05   |
| 95th-Percentile Queue Length [ft/ln]  | 26.77 | 205.02 | 203.41 | 211.19 | 287.90 | 40.59 | 206.49 | 201.22 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 16.29 | 16.29 | 11.22 | 11.23 | 33.31 | 33.31 | 33.31 | 31.44 | 31.44 | 31.44 | 17.27 | 17.27 | 11.27 | 11.29 |
| Movement LOS                    | B     | B     | B     | B     | C     | C     | C     | C     | C     | C     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 11.46 |       |       |       | 33.31 |       |       | 31.44 |       |       | 11.67 |       |       |       |
| Approach LOS                    | B     |       |       |       | C     |       |       | C     |       |       | B     |       |       |       |
| d_I, Intersection Delay [s/veh] | 16.31 |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.465 |       |       |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 57s

SG: 102 15s

SG: 6 57s

SG: 106 15s

SG: 4 33s

SG: 104 15s

SG: 8 33s

SG: 108 15s

### Intersection Level Of Service Report

#### Intersection 28: Ager Rd/Hamilton St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 19.7  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.841

#### Intersection Setup

| Name                   | Hamilton St                                                                       |        |        | Hamilton St                                                                       |        |        | Ager Rd.                                                                            |        |        | Ager Rd.                                                                            |        |         |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|---------|
| Approach               | Eastbound                                                                         |        |        | Westbound                                                                         |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |         |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |         |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00   |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1       |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 1500.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |         |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |         |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |         |

#### Volumes

| Name                                    | Hamilton St |        |        | Hamilton St |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|-----------------------------------------|-------------|--------|--------|-------------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]               | 28          | 74     | 10     | 45          | 220    | 330    | 79       | 180    | 55     | 388      | 347    | 115    |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.33        | 1.72   | 0.00   | 3.85        | 2.08   | 1.91   | 2.06     | 1.84   | 3.33   | 2.21     | 2.00   | 2.63   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]            | 47          | 47     | 58     | 0           | 13     | 0      | 17       | 0      | 0      | 0        | 0      | 14     |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]             | 75          | 121    | 68     | 45          | 233    | 330    | 96       | 180    | 55     | 388      | 347    | 129    |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 21          | 34     | 19     | 13          | 65     | 92     | 27       | 50     | 15     | 108      | 96     | 36     |
| Total Analysis Volume [veh/h]           | 83          | 134    | 76     | 50          | 259    | 367    | 107      | 200    | 61     | 431      | 386    | 143    |
| Presence of On-Street Parking           | No          |        | No     | No          |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0           |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0           |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 80                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 0       | 8       | 0       | 0       | 2       | 0       | 1        | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |          |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | -       | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 10      | 0       | 5        | 10      | 0       |
| Maximum Green [s]            | 0       | 26      | 0       | 0       | 26      | 0       | 0       | 30      | 0       | 10       | 45      | 0       |
| Amber [s]                    | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     |
| Split [s]                    | 0       | 30      | 0       | 0       | 30      | 0       | 0       | 35      | 0       | 15       | 50      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 3.0     | 0.0     | 2.0      | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | Yes     |         | Yes      | Yes     |         |
| Maximum Recall               |         | No      |         |         | No      |         |         | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | C     | C     | C     | C     | L     | C     | C     | L     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 77    | 77    | 77    | 77    | 77    | 77    | 77    | 77    | 77    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00  | 4.00  | 4.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 2.00  | 2.00  | 2.00  | 3.00  | 3.00  | 3.00  | 0.00  | 3.00  |
| g_i, Effective Green Time [s]           | 26    | 26    | 26    | 26    | 28    | 28    | 28    | 42    | 42    |
| g / C, Green / Cycle                    | 0.34  | 0.34  | 0.34  | 0.34  | 0.37  | 0.37  | 0.37  | 0.55  | 0.55  |
| (v / s)_i Volume / Saturation Flow Rate | 0.41  | 0.13  | 0.18  | 0.25  | 0.12  | 0.07  | 0.07  | 0.33  | 0.30  |
| s, saturation flow rate [veh/h]         | 201   | 1598  | 1676  | 1440  | 870   | 1866  | 1720  | 1298  | 1778  |
| c, Capacity [veh/h]                     | 160   | 536   | 617   | 483   | 221   | 685   | 631   | 791   | 974   |
| d1, Uniform Delay [s]                   | 36.05 | 19.66 | 20.65 | 22.92 | 32.09 | 16.70 | 16.74 | 10.63 | 11.26 |
| k, delay calibration                    | 0.50  | 0.11  | 0.12  | 0.27  | 0.11  | 0.11  | 0.11  | 0.50  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 11.43 | 0.47  | 0.68  | 5.98  | 1.64  | 0.14  | 0.16  | 2.69  | 0.47  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |       |       |       |        |        |
|---------------------------------------|-------|--------|--------|--------|-------|-------|-------|--------|--------|
| X, volume / capacity                  | 0.52  | 0.39   | 0.50   | 0.76   | 0.48  | 0.20  | 0.20  | 0.55   | 0.54   |
| d, Delay for Lane Group [s/veh]       | 47.48 | 20.13  | 21.33  | 28.90  | 33.73 | 16.84 | 16.90 | 13.33  | 11.73  |
| Lane Group LOS                        | D     | C      | C      | C      | C     | B     | B     | B      | B      |
| Critical Lane Group                   | Yes   | No     | No     | No     | No    | No    | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 2.04  | 2.77   | 4.26   | 6.31   | 1.96  | 1.54  | 1.47  | 4.36   | 5.11   |
| 50th-Percentile Queue Length [ft/ln]  | 50.92 | 69.33  | 106.48 | 157.77 | 48.96 | 38.49 | 36.74 | 108.94 | 127.66 |
| 95th-Percentile Queue Length [veh/ln] | 3.67  | 4.99   | 7.64   | 10.43  | 3.53  | 2.77  | 2.64  | 7.78   | 8.81   |
| 95th-Percentile Queue Length [ft/ln]  | 91.65 | 124.79 | 191.09 | 260.76 | 88.13 | 69.28 | 66.12 | 194.52 | 220.31 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 47.48 | 20.13 | 20.13 | 21.33 | 21.33 | 28.90 | 33.73 | 16.86 | 16.90 | 13.33 | 11.73 | 11.73 |
| Movement LOS                    | D     | C     | C     | C     | C     | C     | C     | B     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 27.88 |       |       | 25.44 |       |       | 21.77 |       |       | 12.45 |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | C     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 19.73 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.841 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 29: Toledo Rd/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 8.6  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.375

#### Intersection Setup

| Name                   | Belcrest Rd                                                                       |       |       |       | Belcrest Rd                                                                       |       |       |       | Toledo Rd                                                                           |        |        | Toledo Rd                                                                           |        |        |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |       |       |       | Southbound                                                                        |       |       |       | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |       |       |       |  |       |       |       |  |        |        |  |        |        |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | U-tu                                                                              | Left  | Thru  | Right | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 0     | 1                                                                                 | 0     | 0     | 0     | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 400.0                                                                             | 100.0 | 100.0 | 100.0 | 200.0                                                                             | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |       |       |       | 30.00                                                                             |       |       |       | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |       |       |       | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |       |       |       | No                                                                                |       |       |       | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Rd |       |       |       | Belcrest Rd |       |       |       | Toledo Rd |        |        | Toledo Rd |        |        |
|-----------------------------------------|-------------|-------|-------|-------|-------------|-------|-------|-------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h]               | 15          | 96    | 258   | 53    | 2           | 78    | 497   | 73    | 28        | 18     | 28     | 57        | 23     | 90     |
| Base Volume Adjustment Factor           | 1.000       | 1.000 | 1.000 | 1.000 | 1.000       | 1.000 | 1.000 | 1.000 | 1.0000    | 1.0000 | 1.0000 | 1.0000    | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00        | 3.03  | 1.83  | 1.37  | 0.00        | 2.00  | 2.02  | 0.00  | 0.00      | 2.86   | 0.00   | 2.86      | 3.45   | 2.13   |
| Growth Rate                             | 1.00        | 1.00  | 1.00  | 1.00  | 1.00        | 1.00  | 1.00  | 1.00  | 1.00      | 1.00   | 1.00   | 1.00      | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 0     | 18    | 0     | 0           | 0     | 3     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Total Hourly Volume [veh/h]             | 15          | 96    | 276   | 53    | 2           | 78    | 500   | 73    | 28        | 18     | 28     | 57        | 23     | 90     |
| Peak Hour Factor                        | 0.900       | 0.900 | 0.900 | 0.900 | 0.900       | 0.900 | 0.900 | 0.900 | 0.9000    | 0.9000 | 0.9000 | 0.9000    | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.000       | 1.000 | 1.000 | 1.000 | 1.000       | 1.000 | 1.000 | 1.000 | 1.0000    | 1.0000 | 1.0000 | 1.0000    | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4           | 27    | 77    | 15    | 1           | 22    | 139   | 20    | 8         | 5      | 8      | 16        | 6      | 25     |
| Total Analysis Volume [veh/h]           | 17          | 107   | 307   | 59    | 2           | 87    | 556   | 81    | 31        | 20     | 31     | 63        | 26     | 100    |
| Presence of On-Street Parking           | No          |       |       | No    | No          |       |       | No    | No        |        | No     | No        |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Pedestrian Volume [ped/h]               | 8           |       |       |       | 0           |       |       |       | 20        |        |        | 15        |        |        |
| Bicycle Volume [bicycles/h]             | 0           |       |       |       | 0           |       |       |       | 0         |        |        | 0         |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 80                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Permi | Permi | Permi | Permi | Permi | Permi | Permi | Permi | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 2     | 2     | 2     | 2     | 6     | 6     | 6     | 6     | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |         |         |         |         |         |         |
| Lead / Lag                   | Lag   | Lag   | -     | -     | Lag   | Lag   | -     | -     | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 4     | 4     | 4     | 4     | 4     | 4     | 4     | 4     | 4       | 4       | 4       | 4       | 4       | 4       |
| Maximum Green [s]            | 40    | 40    | 40    | 40    | 40    | 40    | 40    | 40    | 30      | 30      | 30      | 30      | 30      | 30      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 45    | 45    | 45    | 45    | 45    | 45    | 45    | 45    | 35      | 35      | 35      | 35      | 35      | 35      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7       | 7       | 7       | 7       | 7       | 7       |
| Pedestrian Clearance [s]     | 15    | 15    | 15    | 15    | 15    | 15    | 15    | 15    | 21      | 21      | 21      | 21      | 21      | 21      |
| Rest In Walk                 |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| Maximum Recall               |       |       | Yes   |       |       |       | Yes   |       |         | No      |         |         | No      |         |
| Pedestrian Recall            |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 30.0  | 30.0  | 0.0   | 0.0   | 0.0   | 0.0   | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | L    | C    | C    | L     | C     | R     | C     |
|-----------------------------------------|------|------|------|------|------|------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 61   | 61   | 61   | 61   | 61   | 61   | 61    | 61    | 61    | 61    |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 40   | 40   | 40   | 40   | 40   | 40   | 11    | 11    | 11    | 11    |
| g / C, Green / Cycle                    | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.18  | 0.18  | 0.18  | 0.18  |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.10 | 0.10 | 0.09 | 0.17 | 0.18 | 0.02  | 0.01  | 0.02  | 0.13  |
| s, saturation flow rate [veh/h]         | 780  | 1866 | 1756 | 1007 | 1862 | 1773 | 1285  | 1847  | 1593  | 1508  |
| c, Capacity [veh/h]                     | 551  | 1231 | 1158 | 711  | 1228 | 1169 | 145   | 324   | 280   | 344   |
| d1, Uniform Delay [s]                   | 7.15 | 3.91 | 3.92 | 5.64 | 4.26 | 4.27 | 29.79 | 20.84 | 21.02 | 23.53 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.94 | 0.26 | 0.28 | 0.36 | 0.53 | 0.56 | 0.72  | 0.08  | 0.17  | 1.37  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |       |       |       |       |       |       |       |       |        |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| X, volume / capacity                  | 0.22  | 0.15  | 0.15  | 0.13  | 0.26  | 0.27  | 0.21  | 0.06  | 0.11  | 0.55   |
| d, Delay for Lane Group [s/veh]       | 8.10  | 4.17  | 4.20  | 6.00  | 4.79  | 4.83  | 30.51 | 20.91 | 21.19 | 24.90  |
| Lane Group LOS                        | A     | A     | A     | A     | A     | A     | C     | C     | C     | C      |
| Critical Lane Group                   | No    | No    | No    | No    | No    | Yes   | No    | No    | No    | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 0.83  | 0.69  | 0.67  | 0.47  | 1.31  | 1.27  | 0.46  | 0.23  | 0.36  | 2.51   |
| 50th-Percentile Queue Length [ft/ln]  | 20.74 | 17.18 | 16.63 | 11.74 | 32.84 | 31.76 | 11.54 | 5.74  | 9.03  | 62.74  |
| 95th-Percentile Queue Length [veh/ln] | 1.49  | 1.24  | 1.20  | 0.85  | 2.36  | 2.29  | 0.83  | 0.41  | 0.65  | 4.52   |
| 95th-Percentile Queue Length [ft/ln]  | 37.32 | 30.93 | 29.93 | 21.13 | 59.11 | 57.16 | 20.78 | 10.33 | 16.26 | 112.94 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |      |      |      |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 8.10  | 8.10 | 4.18 | 4.20 | 6.00 | 6.00 | 4.80 | 4.83 | 30.51 | 20.91 | 21.19 | 24.90 | 24.90 | 24.90 |
| Movement LOS                    | A     | A    | A    | A    | A    | A    | A    | A    | C     | C     | C     | C     | C     | C     |
| d_A, Approach Delay [s/veh]     | 5.17  |      |      |      | 4.95 |      |      |      | 24.65 |       |       | 24.90 |       |       |
| Approach LOS                    | A     |      |      |      | A    |      |      |      | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 8.65  |      |      |      |      |      |      |      |       |       |       |       |       |       |
| Intersection LOS                | A     |      |      |      |      |      |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.375 |      |      |      |      |      |      |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 45s

SG: 102 22s

SG: 6 45s

SG: 106 22s

SG: 4 35s

SG: 104 28s

SG: 8 35s



### Intersection Level Of Service Report

#### Intersection 30: Adelphi Rd/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 23.7  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.783

#### Intersection Setup

| Name                   | Belcrest Rd                                                                       |        |        | Underwood St                                                                      |        |        | Adelphi Rd                                                                          |       |       |       | Adelphi Rd                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |       |       |       | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |       |       |       |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0     | 0     | 0     | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 150.0                                                                               | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |       |       |       | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |       |       |       | 0.00                                                                                |        |        |
| Crosswalk              | No                                                                                |        |        | Yes                                                                               |        |        | Yes                                                                                 |       |       |       | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Rd |        |        | Underwood St |        |        | Adelphi Rd |       |       |       | Adelphi Rd |        |        |
|-----------------------------------------|-------------|--------|--------|--------------|--------|--------|------------|-------|-------|-------|------------|--------|--------|
| Base Volume Input [veh/h]               | 376         | 0      | 31     | 18           | 42     | 6      | 2          | 37    | 1013  | 0     | 0          | 735    | 680    |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000      | 1.000 | 1.000 | 1.000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.12        | 0.00   | 0.00   | 0.00         | 0.00   | 0.00   | 0.00       | 0.00  | 1.98  | 0.00  | 0.00       | 1.99   | 1.94   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00       | 1.00  | 1.00  | 1.00  | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 18          | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 12    | 0     | 0          | 5      | 3      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 394         | 0      | 31     | 18           | 42     | 6      | 2          | 37    | 1025  | 0     | 0          | 740    | 683    |
| Peak Hour Factor                        | 0.9000      | 1.0000 | 1.0000 | 0.9000       | 0.9000 | 0.9000 | 0.900      | 0.900 | 0.900 | 1.000 | 1.0000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000      | 1.000 | 1.000 | 1.000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 109         | 0      | 8      | 5            | 12     | 2      | 1          | 10    | 285   | 0     | 0          | 206    | 190    |
| Total Analysis Volume [veh/h]           | 438         | 0      | 31     | 20           | 47     | 7      | 2          | 41    | 1139  | 0     | 0          | 822    | 759    |
| Presence of On-Street Parking           | No          |        | No     | No           |        | No     | No         |       |       | No    | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0            |        |        | 1          |       |       |       | 5          |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0            |        |        | 0          |       |       |       | 0          |        |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 120            |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 15.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 12.00          |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Permi | Prote | Permi | Permi | Permiss | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 4     | 0     | 0     | 8     | 8     | 8     | 5     | 5     | 2     | 0     | 0       | 6       | 6       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |       |       |         |         |         |
| Lead / Lag                   | Lead  | -     | -     | Lag   | -     | -     | Lead  | Lead  | -     | -     | -       | -       | -       |
| Minimum Green [s]            | 4     | 0     | 0     | 4     | 4     | 4     | 4     | 4     | 4     | 0     | 0       | 4       | 4       |
| Maximum Green [s]            | 30    | 0     | 0     | 16    | 16    | 16    | 11    | 11    | 60    | 0     | 0       | 45      | 45      |
| Amber [s]                    | 4.0   | 0.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.5   | 3.5   | 3.5   | 0.0   | 0.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 0.0   | 0.0   | 1.0   | 1.0   | 1.0   | 0.5   | 0.5   | 1.0   | 0.0   | 0.0     | 1.0     | 1.0     |
| Split [s]                    | 30    | 0     | 0     | 30    | 30    | 30    | 30    | 30    | 30    | 0     | 0       | 30      | 30      |
| Vehicle Extension [s]        | 3.0   | 0.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 3.0     |
| Walk [s]                     | 4     | 0     | 0     | 4     | 4     | 4     | 0     | 0     | 3     | 0     | 0       | 3       | 3       |
| Pedestrian Clearance [s]     | 13    | 0     | 0     | 13    | 13    | 13    | 0     | 0     | 8     | 0     | 0       | 8       | 8       |
| Rest In Walk                 | No    |       |       |       | No    |       |       |       | No    |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 0.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 0.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.5   | 0.0   | 0.0     | 3.0     | 3.0     |
| Minimum Recall               | No    |       |       |       | No    |       |       | No    | No    |       |         | No      |         |
| Maximum Recall               | No    |       |       |       | No    |       |       | No    | Yes   |       |         | Yes     |         |
| Pedestrian Recall            | No    |       |       |       | No    |       |       | No    | No    |       |         | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 30.0  | 30.0  | 30.0  | 0.0   | 0.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C    | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|------|-------|-------|
| C, Cycle Length [s]                     | 94    | 94    | 94    | 94    | 94   | 94    | 94    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 4.00  | 4.25  | 4.50 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 2.00  | 0.00  | 2.50 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 15    | 15    | 6     | 60    | 60   | 53    | 53    |
| g / C, Green / Cycle                    | 0.16  | 0.16  | 0.06  | 0.64  | 0.64 | 0.56  | 0.56  |
| (v / s)_i Volume / Saturation Flow Rate | 0.13  | 0.13  | 0.04  | 0.02  | 0.32 | 0.42  | 0.50  |
| s, saturation flow rate [veh/h]         | 1772  | 1781  | 1844  | 1810  | 3547 | 1863  | 1593  |
| c, Capacity [veh/h]                     | 285   | 287   | 113   | 453   | 2251 | 1039  | 889   |
| d1, Uniform Delay [s]                   | 38.33 | 38.33 | 43.38 | 19.23 | 9.30 | 16.05 | 18.34 |
| k, delay calibration                    | 0.11  | 0.11  | 0.11  | 0.50  | 0.50 | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 5.77  | 5.75  | 6.19  | 0.42  | 0.82 | 5.25  | 12.93 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |       |        |        |        |
|---------------------------------------|--------|--------|-------|-------|--------|--------|--------|
| X, volume / capacity                  | 0.82   | 0.82   | 0.65  | 0.10  | 0.51   | 0.76   | 0.89   |
| d, Delay for Lane Group [s/veh]       | 44.10  | 44.08  | 49.56 | 19.64 | 10.11  | 21.30  | 31.27  |
| Lane Group LOS                        | D      | D      | D     | B     | B      | C      | C      |
| Critical Lane Group                   | No     | Yes    | Yes   | Yes   | No     | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 5.61   | 5.64   | 1.87  | 0.35  | 5.86   | 13.45  | 16.83  |
| 50th-Percentile Queue Length [ft/ln]  | 140.36 | 141.04 | 46.79 | 8.67  | 146.55 | 336.28 | 420.83 |
| 95th-Percentile Queue Length [veh/ln] | 9.50   | 9.54   | 3.37  | 0.62  | 9.83   | 19.47  | 23.56  |
| 95th-Percentile Queue Length [ft/ln]  | 237.51 | 238.42 | 84.22 | 15.61 | 245.82 | 486.65 | 589.05 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |       |       |       |       |       |       |      |       |       |
|---------------------------------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 44.09 | 0.00 | 44.08 | 49.56 | 49.56 | 49.56 | 19.64 | 19.64 | 10.11 | 0.00  | 0.00 | 21.68 | 31.27 |
| Movement LOS                    | D     |      | D     | D     | D     | D     | B     | B     | B     |       |      | C     | C     |
| d_A, Approach Delay [s/veh]     | 44.09 |      |       | 49.56 |       |       | 10.46 |       |       | 26.29 |      |       |       |
| Approach LOS                    | D     |      |       | D     |       |       | B     |       |       | C     |      |       |       |
| d_I, Intersection Delay [s/veh] | 23.67 |      |       |       |       |       |       |       |       |       |      |       |       |
| Intersection LOS                | C     |      |       |       |       |       |       |       |       |       |      |       |       |
| Intersection V/C                | 0.783 |      |       |       |       |       |       |       |       |       |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | 8 | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 31: Adelphi Rd/Campus Dr

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 31.8  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.473

#### Intersection Setup

| Name                   | Adelphi Rd.                                                                       |        |        | Adelphi Rd.                                                                       |        |        | Campus Dr.                                                                          |        |        | Campus Dr.                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 1      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 350.00                                                                            | 100.00 | 500.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 250.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 40.00                                                                             |        |        | 40.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Adelphi Rd. |        |        | Adelphi Rd. |        |        | Campus Dr. |        |        | Campus Dr. |        |        |
|-----------------------------------------|-------------|--------|--------|-------------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 230         | 953    | 80     | 209         | 1338   | 0      | 0          | 140    | 206    | 73         | 127    | 66     |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.27        | 2.08   | 2.27   | 2.00        | 2.05   | 0.00   | 0.00       | 2.00   | 2.21   | 2.00       | 2.00   | 2.00   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 30     | 0      | 0           | 8      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 230         | 983    | 80     | 209         | 1346   | 0      | 0          | 140    | 206    | 73         | 127    | 66     |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 1.0000 | 1.0000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 64          | 273    | 22     | 58          | 374    | 0      | 0          | 39     | 57     | 20         | 35     | 18     |
| Total Analysis Volume [veh/h]           | 256         | 1092   | 89     | 232         | 1496   | 0      | 0          | 156    | 229    | 81         | 141    | 73     |
| Presence of On-Street Parking           | No          |        | No     | No          |        | No     | No         |        | No     | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0           |        |        | 0          |        |        | 0          |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0           |        |        | 0          |        |        | 0          |        |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 248            |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 45.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 12.00          |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Overlap | Overlap | Permiss | Permiss | Permiss | Permiss | Split | Split | Split |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|-------|-------|-------|
| Signal group                 | 3        | 8       | 8       | 1       | 1       | 0       | 0       | 2       | 2       | 6     | 6     | 6     |
| Auxiliary Signal Groups      |          |         |         | 1,7     | 1,4     |         |         |         |         |       |       |       |
| Lead / Lag                   | Lag      | -       | -       | Lag     | -       | -       | -       | -       | -       | Lag   | -     | -     |
| Minimum Green [s]            | 5        | 8       | 8       | 15      | 15      | 0       | 0       | 25      | 25      | 5     | 5     | 5     |
| Maximum Green [s]            | 30       | 60      | 60      | 40      | 40      | 0       | 0       | 60      | 60      | 30    | 30    | 30    |
| Amber [s]                    | 4.0      | 4.0     | 4.0     | 4.0     | 4.0     | 0.0     | 0.0     | 4.5     | 4.5     | 4.5   | 4.5   | 4.5   |
| All red [s]                  | 1.0      | 2.0     | 2.0     | 1.0     | 1.0     | 0.0     | 0.0     | 1.5     | 1.5     | 1.5   | 1.5   | 1.5   |
| Split [s]                    | 30       | 30      | 30      | 30      | 30      | 0       | 0       | 30      | 30      | 30    | 30    | 30    |
| Vehicle Extension [s]        | 3.0      | 3.5     | 3.5     | 3.0     | 3.0     | 0.0     | 0.0     | 4.0     | 4.0     | 3.0   | 3.0   | 3.0   |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0     | 0     | 0     |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |       | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 0.0     | 0.0     | 2.0     | 2.0     | 2.0   | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0      | 4.0     | 4.0     | 3.0     | 3.0     | 0.0     | 0.0     | 4.0     | 4.0     | 4.0   | 4.0   | 4.0   |
| Minimum Recall               | Yes      | Yes     |         | Yes     | Yes     |         |         | Yes     |         |       | Yes   |       |
| Maximum Recall               | No       | No      |         | No      | No      |         |         | No      |         |       | No    |       |
| Pedestrian Recall            | No       | No      |         | No      | No      |         |         | No      |         |       | No    |       |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 30.0     | 30.0    | 30.0    | 30.0    | 30.0    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | C     | R     | C     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 118   | 118   | 118   | 118   | 118   | 118   | 118   | 118   | 118   | 118   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 6.00  | 6.00  | 5.00  | 5.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 4.00  | 4.00  | 0.00  | 0.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 19    | 34    | 34    | 57    | 73    | 25    | 25    | 10    | 10    | 10    |
| g / C, Green / Cycle                    | 0.16  | 0.28  | 0.28  | 0.49  | 0.62  | 0.21  | 0.21  | 0.09  | 0.09  | 0.09  |
| (v / s)_i Volume / Saturation Flow Rate | 0.14  | 0.22  | 0.06  | 0.07  | 0.42  | 0.04  | 0.14  | 0.06  | 0.06  | 0.05  |
| s, saturation flow rate [veh/h]         | 1769  | 5070  | 1579  | 3445  | 3545  | 3547  | 1580  | 1800  | 1695  | 1583  |
| c, Capacity [veh/h]                     | 291   | 1447  | 451   | 1672  | 2179  | 751   | 335   | 154   | 145   | 135   |
| d1, Uniform Delay [s]                   | 48.22 | 38.46 | 31.98 | 16.78 | 15.18 | 38.40 | 42.93 | 52.79 | 52.73 | 51.80 |
| k, delay calibration                    | 0.12  | 0.13  | 0.13  | 0.11  | 0.17  | 0.15  | 0.15  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 9.40  | 0.99  | 0.26  | 0.04  | 0.62  | 0.19  | 3.51  | 7.10  | 7.08  | 3.31  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

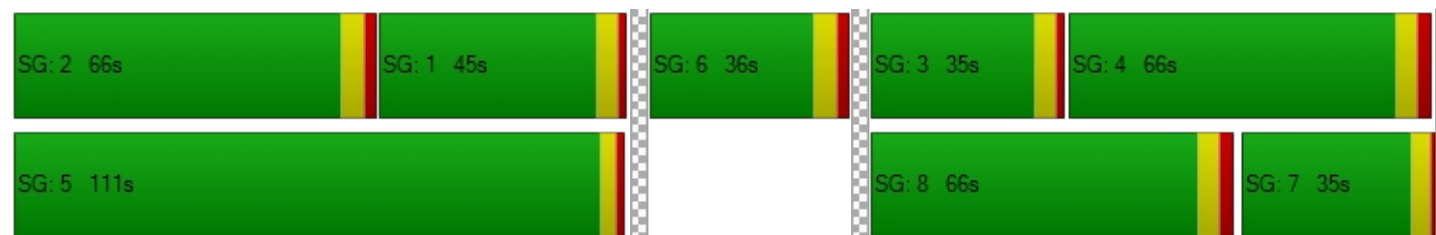
|                                       |        |        |       |       |        |       |        |        |        |       |
|---------------------------------------|--------|--------|-------|-------|--------|-------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.88   | 0.75   | 0.20  | 0.14  | 0.69   | 0.21  | 0.68   | 0.75   | 0.74   | 0.54  |
| d, Delay for Lane Group [s/veh]       | 57.61  | 39.45  | 32.24 | 16.82 | 15.80  | 38.59 | 46.44  | 59.89  | 59.82  | 55.11 |
| Lane Group LOS                        | E      | D      | C     | B     | B      | D     | D      | E      | E      | E     |
| Critical Lane Group                   | Yes    | No     | No    | No    | Yes    | No    | Yes    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 7.96   | 9.46   | 1.93  | 1.69  | 12.20  | 1.87  | 6.41   | 3.61   | 3.35   | 2.18  |
| 50th-Percentile Queue Length [ft/ln]  | 199.07 | 236.50 | 48.21 | 42.25 | 304.89 | 46.85 | 160.29 | 90.31  | 83.69  | 54.53 |
| 95th-Percentile Queue Length [veh/ln] | 12.59  | 14.50  | 3.47  | 3.04  | 17.92  | 3.37  | 10.56  | 6.50   | 6.03   | 3.93  |
| 95th-Percentile Queue Length [ft/ln]  | 314.76 | 362.61 | 86.78 | 76.05 | 448.08 | 84.34 | 264.11 | 162.56 | 150.64 | 98.16 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |      |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 57.61 | 39.45 | 32.24 | 16.82 | 15.80 | 0.00 | 0.00  | 38.59 | 46.44 | 59.89 | 59.84 | 55.11 |
| Movement LOS                    | E     | D     | C     | B     | B     |      |       | D     | D     | E     | E     | E     |
| d_A, Approach Delay [s/veh]     | 42.24 |       |       | 15.94 |       |      | 43.26 |       |       | 58.68 |       |       |
| Approach LOS                    | D     |       |       | B     |       |      | D     |       |       | E     |       |       |
| d_I, Intersection Delay [s/veh] | 31.78 |       |       |       |       |      |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |      |       |       |       |       |       |       |
| Intersection V/C                | 0.473 |       |       |       |       |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 6 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | - | - | 8 | 7 | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 32: Adelphi Rd/Toledo Rd

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 6.3  
Level Of Service: A  
Volume to Capacity (v/c): 0.424

#### Intersection Setup

| Name                   | Adelphi Rd                                                                        |        |        | Adelphi Rd                                                                         |        | Toledo Rd                                                                           |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |        |  |        |  |        |
| Turning Movement       | U-turn                                                                            | Left   | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 0                                                                                  | 1      | 0                                                                                   | 1      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 200.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 30.00                                                                              |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        |        | No                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Adelphi Rd |        |        | Adelphi Rd |        | Toledo Rd |        |
|-----------------------------------------|------------|--------|--------|------------|--------|-----------|--------|
| Base Volume Input [veh/h]               | 6          | 156    | 1022   | 667        | 104    | 51        | 75     |
| Base Volume Adjustment Factor           | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000    | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00       | 1.97   | 2.01   | 2.05       | 1.88   | 2.38      | 1.96   |
| Growth Rate                             | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00      | 1.00   |
| In-Process Volume [veh/h]               | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Site-Generated Trips [veh/h]            | 0          | 0      | 12     | 5          | 0      | 0         | 0      |
| Diverted Trips [veh/h]                  | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Pass-by Trips [veh/h]                   | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Existing Site Adjustment Volume [veh/h] | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Other Volume [veh/h]                    | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Right-Turn on Red Volume [veh/h]        | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Total Hourly Volume [veh/h]             | 6          | 156    | 1034   | 672        | 104    | 51        | 75     |
| Peak Hour Factor                        | 0.9000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000    | 0.9000 |
| Other Adjustment Factor                 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000    | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2          | 43     | 287    | 187        | 29     | 14        | 21     |
| Total Analysis Volume [veh/h]           | 7          | 173    | 1149   | 747        | 116    | 57        | 83     |
| Presence of On-Street Parking           | No         |        | No     | No         | No     | No        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Local Bus Stopping Rate [/h]            | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Pedestrian Volume [ped/h]               | 6          |        |        | 0          |        | 6         |        |
| Bicycle Volume [bicycles/h]             | 0          |        |        | 0          |        | 0         |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 100                          |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 9.00                         |

**Phasing & Timing**

| Control Type                 | Permissive | ProtectedP | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 5          | 5          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |            |       |       |
| Lead / Lag                   | Lead       | Lead       | -          | -          | -          | Lag   | -     |
| Minimum Green [s]            | 4          | 4          | 4          | 4          | 4          | 4     | 4     |
| Maximum Green [s]            | 15         | 15         | 65         | 45         | 45         | 25    | 25    |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 4.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 20         | 20         | 70         | 50         | 50         | 30    | 30    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 0          | 0          | 7          | 7          | 7          | 7     | 7     |
| Pedestrian Clearance [s]     | 0          | 0          | 6          | 6          | 6          | 13    | 13    |
| Rest In Walk                 |            |            | No         | No         |            | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Minimum Recall               |            | No         | No         | No         |            | No    |       |
| Maximum Recall               |            | No         | Yes        | Yes        |            | No    |       |
| Pedestrian Recall            |            | No         | No         | No         |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 30.0       | 30.0       | 30.0       | 30.0       | 30.0       | 30.0  | 30.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | R    | L     | R     |
|-----------------------------------------|------|------|------|------|-------|-------|
| C, Cycle Length [s]                     | 82   | 82   | 82   | 82   | 82    | 82    |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00 | 3.00 | 3.00 | 3.00 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 65   | 65   | 56   | 56   | 7     | 7     |
| g / C, Green / Cycle                    | 0.79 | 0.79 | 0.68 | 0.68 | 0.09  | 0.09  |
| (v / s)_i Volume / Saturation Flow Rate | 0.22 | 0.32 | 0.21 | 0.07 | 0.03  | 0.05  |
| s, saturation flow rate [veh/h]         | 834  | 3546 | 3545 | 1578 | 1767  | 1552  |
| c, Capacity [veh/h]                     | 718  | 2796 | 2390 | 1064 | 159   | 140   |
| d1, Uniform Delay [s]                   | 2.58 | 2.73 | 5.55 | 4.73 | 35.26 | 36.05 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.84 | 0.45 | 0.34 | 0.21 | 1.35  | 3.96  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |       |        |       |       |       |
|---------------------------------------|-------|-------|--------|-------|-------|-------|
| X, volume / capacity                  | 0.25  | 0.41  | 0.31   | 0.11  | 0.36  | 0.59  |
| d, Delay for Lane Group [s/veh]       | 3.41  | 3.17  | 5.89   | 4.93  | 36.61 | 40.01 |
| Lane Group LOS                        | A     | A     | A      | A     | D     | D     |
| Critical Lane Group                   | No    | Yes   | No     | No    | No    | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 0.42  | 1.24  | 2.26   | 0.63  | 1.12  | 1.73  |
| 50th-Percentile Queue Length [ft/ln]  | 10.46 | 31.04 | 56.47  | 15.72 | 27.93 | 43.20 |
| 95th-Percentile Queue Length [veh/ln] | 0.75  | 2.24  | 4.07   | 1.13  | 2.01  | 3.11  |
| 95th-Percentile Queue Length [ft/ln]  | 18.83 | 55.88 | 101.65 | 28.29 | 50.27 | 77.76 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |      |       |       |
|---------------------------------|-------|------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 3.41  | 3.41 | 3.17 | 5.89 | 4.93 | 36.61 | 40.01 |
| Movement LOS                    | A     | A    | A    | A    | A    | D     | D     |
| d_A, Approach Delay [s/veh]     | 3.21  |      |      | 5.76 |      | 38.63 |       |
| Approach LOS                    | A     |      |      | A    |      | D     |       |
| d_I, Intersection Delay [s/veh] | 6.28  |      |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |      |       |       |
| Intersection V/C                | 0.424 |      |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 33: Hamilton St/40th Pl/39th Ave

Control Type: Roundabout  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 8.1  
 Level Of Service: A

#### Intersection Setup

| Name                   | Magruder Park Ent |        |        |        | 39th Ave   |        |        |        | Hamilton St |        |        |        |
|------------------------|-------------------|--------|--------|--------|------------|--------|--------|--------|-------------|--------|--------|--------|
| Approach               | Northbound        |        |        |        | Southbound |        |        |        | Eastbound   |        |        |        |
| Lane Configuration     |                   |        |        |        |            |        |        |        |             |        |        |        |
| Turning Movement       | Left              | Thru   | Right  | Right2 | Left2      | Left   | Thru   | Right  | Left2       | Left   | Thru   | Right  |
| Lane Width [ft]        | 12.00             | 12.00  | 12.00  | 12.00  | 12.00      | 12.00  | 12.00  | 12.00  | 12.00       | 12.00  | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                 | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pocket Length [ft]     | 100.00            | 100.00 | 100.00 | 100.00 | 100.00     | 100.00 | 100.00 | 100.00 | 100.00      | 100.00 | 100.00 | 100.00 |
| Speed [mph]            | 30.00             |        |        |        | 30.00      |        |        |        | 35.00       |        |        |        |
| Grade [%]              | 0.00              |        |        |        | 0.00       |        |        |        | 0.00        |        |        |        |
| Crosswalk              | Yes               |        |        |        | Yes        |        |        |        | Yes         |        |        |        |

#### Volumes

| Name                                    | Magruder Park Ent |        |        |        | 39th Ave |        |        |        | Hamilton St |        |        |        |
|-----------------------------------------|-------------------|--------|--------|--------|----------|--------|--------|--------|-------------|--------|--------|--------|
| Base Volume Input [veh/h]               | 4                 | 1      | 0      | 2      | 0        | 6      | 2      | 29     | 62          | 0      | 335    | 8      |
| Base Volume Adjustment Factor           | 1.0000            | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00              | 0.00   | 0.00   | 0.00   | 0.00     | 0.00   | 0.00   | 0.00   | 3.85        | 0.00   | 2.15   | 0.00   |
| Growth Rate                             | 1.00              | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 12     | 0      |
| Diverted Trips [veh/h]                  | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 4                 | 1      | 0      | 2      | 0        | 6      | 2      | 29     | 62          | 0      | 347    | 8      |
| Peak Hour Factor                        | 0.9000            | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000            | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1                 | 0      | 0      | 1      | 0        | 2      | 1      | 8      | 17          | 0      | 96     | 2      |
| Total Analysis Volume [veh/h]           | 4                 | 1      | 0      | 2      | 0        | 7      | 2      | 32     | 69          | 0      | 386    | 9      |
| Pedestrian Volume [ped/h]               | 0                 |        |        |        | 0        |        |        |        | 0           |        |        |        |

**Intersection Settings**

|                                         |     |   |   |   |     |   |   |    |     |   |     |   |
|-----------------------------------------|-----|---|---|---|-----|---|---|----|-----|---|-----|---|
| Number of Conflicting Circulating Lanes | 1   |   |   |   | 1   |   |   |    | 1   |   |     |   |
| Circulating Flow Rate [veh/h]           | 480 |   |   |   | 587 |   |   |    | 36  |   |     |   |
| Exiting Flow Rate [veh/h]               | 31  |   |   |   | 77  |   |   |    | 592 |   |     |   |
| Demand Flow Rate [veh/h]                | 4   | 1 | 0 | 2 | 0   | 6 | 2 | 29 | 62  | 0 | 347 | 8 |
| Adjusted Demand Flow Rate [veh/h]       | 4   | 1 | 0 | 2 | 0   | 7 | 2 | 32 | 69  | 0 | 386 | 9 |

**Lanes**

|                                            |         |  |  |  |         |  |  |  |         |  |  |  |
|--------------------------------------------|---------|--|--|--|---------|--|--|--|---------|--|--|--|
| Overwrite Calculated Critical Headway      | No      |  |  |  | No      |  |  |  | No      |  |  |  |
| User-Defined Critical Headway [s]          | 4.00    |  |  |  | 4.00    |  |  |  | 4.00    |  |  |  |
| Overwrite Calculated Follow-Up Time        | No      |  |  |  | No      |  |  |  | No      |  |  |  |
| User-Defined Follow-Up Time [s]            | 3.00    |  |  |  | 3.00    |  |  |  | 3.00    |  |  |  |
| A (intercept)                              | 1130.00 |  |  |  | 1130.00 |  |  |  | 1130.00 |  |  |  |
| B (coefficient)                            | 0.00100 |  |  |  | 0.00100 |  |  |  | 0.00100 |  |  |  |
| HV Adjustment Factor                       | 1.00    |  |  |  | 1.00    |  |  |  | 0.98    |  |  |  |
| Entry Flow Rate [veh/h]                    | 7       |  |  |  | 41      |  |  |  | 475     |  |  |  |
| Capacity of Entry and Bypass Lanes [veh/h] | 700     |  |  |  | 629     |  |  |  | 1091    |  |  |  |
| Pedestrian Impedance                       | 1.00    |  |  |  | 1.00    |  |  |  | 1.00    |  |  |  |
| Capacity per Entry Lane [veh/h]            | 700     |  |  |  | 629     |  |  |  | 1065    |  |  |  |
| X, volume / capacity                       | 0.01    |  |  |  | 0.07    |  |  |  | 0.44    |  |  |  |

**Movement, Approach, & Intersection Results**

|                                    |      |      |       |
|------------------------------------|------|------|-------|
| Lane LOS                           | A    | A    | A     |
| 95th-Percentile Queue Length [veh] | 0.03 | 0.21 | 2.25  |
| 95th-Percentile Queue Length [ft]  | 0.76 | 5.22 | 56.23 |
| Approach Delay [s/veh]             | 5.25 | 6.46 | 8.14  |
| Approach LOS                       | A    | A    | A     |
| Intersection Delay [s/veh]         | 8.06 |      |       |
| Intersection LOS                   | A    |      |       |

**Intersection Setup**

| Name                   | Hamilton St                                                                       |        |        |        | Gallatin St                                                                         |        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|--------|
| Approach               | Westbound                                                                         |        |        |        | Northwestbound                                                                      |        |        |        |
| Lane Configuration     |  |        |        |        |  |        |        |        |
| Turning Movement       | Left2                                                                             | Left   | Thru   | Right  | Left                                                                                | Thru   | Right  | Right2 |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0      | 0                                                                                   | 0      | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        |        | 35.00                                                                               |        |        |        |
| Grade [%]              | 0.00                                                                              |        |        |        | 0.00                                                                                |        |        |        |
| Crosswalk              | Yes                                                                               |        |        |        | Yes                                                                                 |        |        |        |

**Volumes**

| Name                                    | Hamilton St |        |        |        | Gallatin St |        |        |        |
|-----------------------------------------|-------------|--------|--------|--------|-------------|--------|--------|--------|
| Base Volume Input [veh/h]               | 6           | 6      | 112    | 2      | 12          | 375    | 2      | 0      |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00        | 0.00   | 2.20   | 0.00   | 0.00        | 2.18   | 0.00   | 0.00   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 0      | 0      | 0      | 0           | 3      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 6           | 6      | 112    | 2      | 12          | 378    | 2      | 0      |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2           | 2      | 31     | 1      | 3           | 105    | 1      | 0      |
| Total Analysis Volume [veh/h]           | 7           | 7      | 124    | 2      | 13          | 420    | 2      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        |        | 0           |        |        |        |

**Intersection Settings**

|                                         |     |   |     |   |     |     |   |   |
|-----------------------------------------|-----|---|-----|---|-----|-----|---|---|
| Number of Conflicting Circulating Lanes | 1   |   |     |   | 1   |     |   |   |
| Circulating Flow Rate [veh/h]           | 521 |   |     |   | 77  |     |   |   |
| Exiting Flow Rate [veh/h]               | 0   |   |     |   | 410 |     |   |   |
| Demand Flow Rate [veh/h]                | 6   | 6 | 112 | 2 | 12  | 378 | 2 | 0 |
| Adjusted Demand Flow Rate [veh/h]       | 7   | 7 | 124 | 2 | 13  | 420 | 2 | 0 |

**Lanes**

|                                            |         |  |  |  |         |  |  |  |
|--------------------------------------------|---------|--|--|--|---------|--|--|--|
| Overwrite Calculated Critical Headway      | No      |  |  |  | No      |  |  |  |
| User-Defined Critical Headway [s]          | 4.00    |  |  |  | 4.00    |  |  |  |
| Overwrite Calculated Follow-Up Time        | No      |  |  |  | No      |  |  |  |
| User-Defined Follow-Up Time [s]            | 3.00    |  |  |  | 3.00    |  |  |  |
| A (intercept)                              | 1130.00 |  |  |  | 1130.00 |  |  |  |
| B (coefficient)                            | 0.00100 |  |  |  | 0.00100 |  |  |  |
| HV Adjustment Factor                       | 0.98    |  |  |  | 0.98    |  |  |  |
| Entry Flow Rate [veh/h]                    | 143     |  |  |  | 445     |  |  |  |
| Capacity of Entry and Bypass Lanes [veh/h] | 672     |  |  |  | 1047    |  |  |  |
| Pedestrian Impedance                       | 1.00    |  |  |  | 1.00    |  |  |  |
| Capacity per Entry Lane [veh/h]            | 659     |  |  |  | 1026    |  |  |  |
| X, volume / capacity                       | 0.21    |  |  |  | 0.42    |  |  |  |

**Movement, Approach, & Intersection Results**

|                                    |       |  |  |  |       |  |  |  |
|------------------------------------|-------|--|--|--|-------|--|--|--|
| Lane LOS                           | A     |  |  |  | A     |  |  |  |
| 95th-Percentile Queue Length [veh] | 0.80  |  |  |  | 2.15  |  |  |  |
| 95th-Percentile Queue Length [ft]  | 20.01 |  |  |  | 53.73 |  |  |  |
| Approach Delay [s/veh]             | 8.00  |  |  |  | 8.20  |  |  |  |
| Approach LOS                       | A     |  |  |  | A     |  |  |  |
| Intersection Delay [s/veh]         | 8.06  |  |  |  |       |  |  |  |
| Intersection LOS                   | A     |  |  |  |       |  |  |  |

### Intersection Level Of Service Report

#### Intersection 4281: New Intersection

Control Type: Two-way stop  
 Analysis Method: HCM 6th Edition  
 Analysis Period: 15 minutes

Delay (sec / veh): 12.6  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.000

#### Intersection Setup

| Name                   |                                                                                   |        |        |                                                                                   |        |        | Queensbury                                                                          |        |        | Queensbury                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        |        |        |        | Queensbury |        |        | Queensbury |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 267    | 0      | 0          | 218    | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00       | 2.00   | 2.00   | 2.00       | 2.00   | 2.00   |
| Growth Rate                             | 1.02   | 1.02   | 1.02   | 1.02   | 1.02   | 1.02   | 1.02       | 1.02   | 1.02   | 1.02       | 1.02   | 1.02   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 272    | 0      | 0          | 222    | 0      |
| Peak Hour Factor                        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 68     | 0      | 0          | 56     | 0      |
| Total Analysis Volume [veh/h]           | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 272    | 0      | 0          | 222    | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 0          |        |        | 0          |        |        |

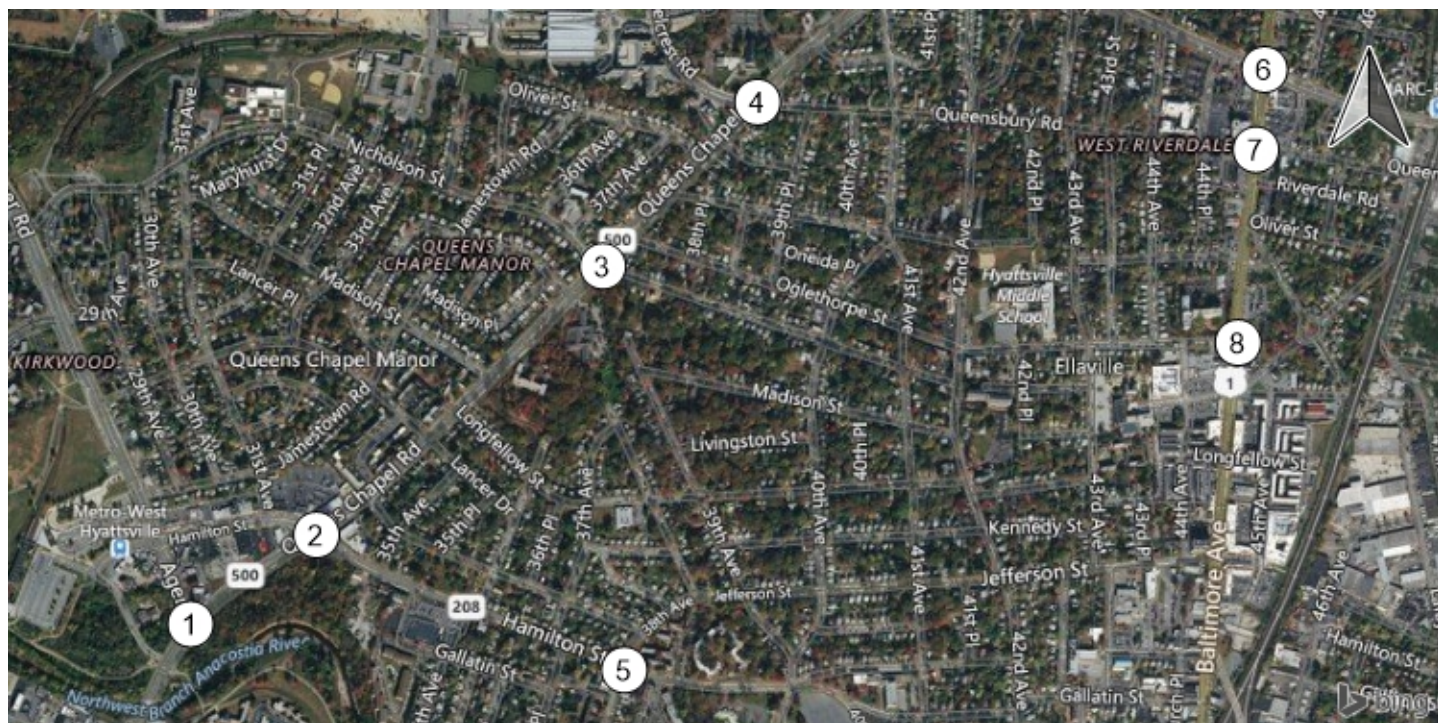
**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Stop | Stop | Free | Free |
| Flared Lane                        | No   | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

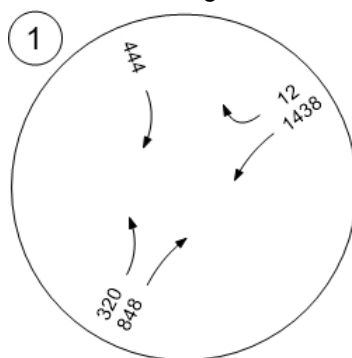
**Movement, Approach, & Intersection Results**

|                                       |       |       |      |       |       |      |      |      |      |      |      |      |
|---------------------------------------|-------|-------|------|-------|-------|------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 12.41 | 12.56 | 9.70 | 12.41 | 12.56 | 9.40 | 7.67 | 0.00 | 0.00 | 7.79 | 0.00 | 0.00 |
| Movement LOS                          | B     | B     | A    | B     | B     | A    | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 11.56 |       |      | 11.46 |       |      | 0.00 |      |      | 0.00 |      |      |
| Approach LOS                          | B     |       |      | B     |       |      | A    |      |      | A    |      |      |
| d_I, Intersection Delay [s/veh]       | 0.00  |       |      |       |       |      |      |      |      |      |      |      |
| Intersection LOS                      | B     |       |      |       |       |      |      |      |      |      |      |      |

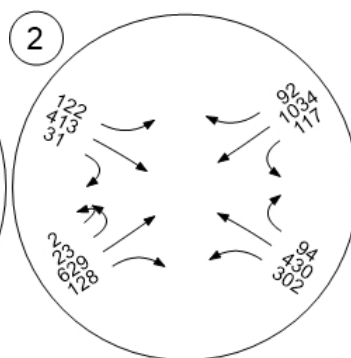
## Traffic Volume - Future Total Volume



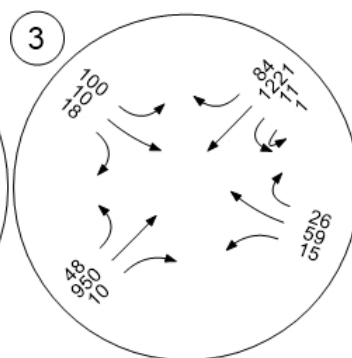
MD 500/Ager Rd



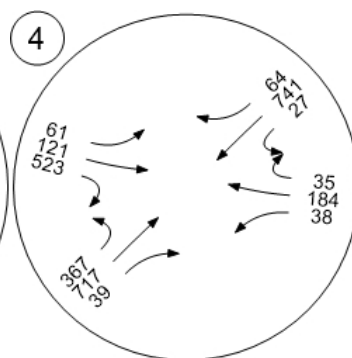
MD 500/Hamilton St



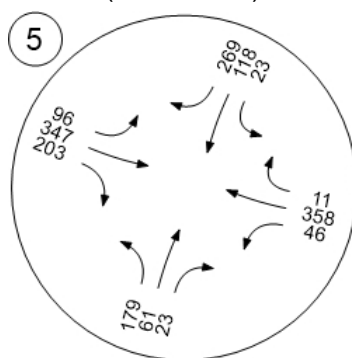
MD 500/Nicholson St



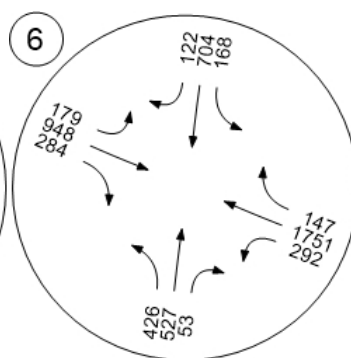
MD 500/Belcrest Rd/Queens



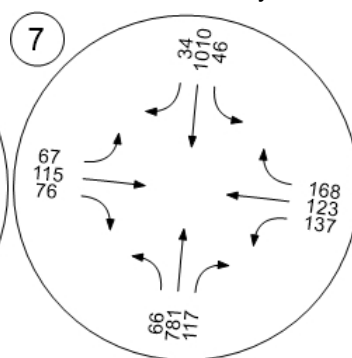
MD 208(Hamilton St)/38th Av



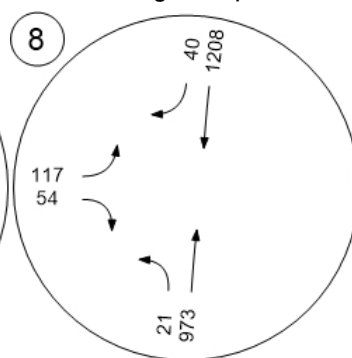
US 1/MD 410



US 1/Queensbury Rd

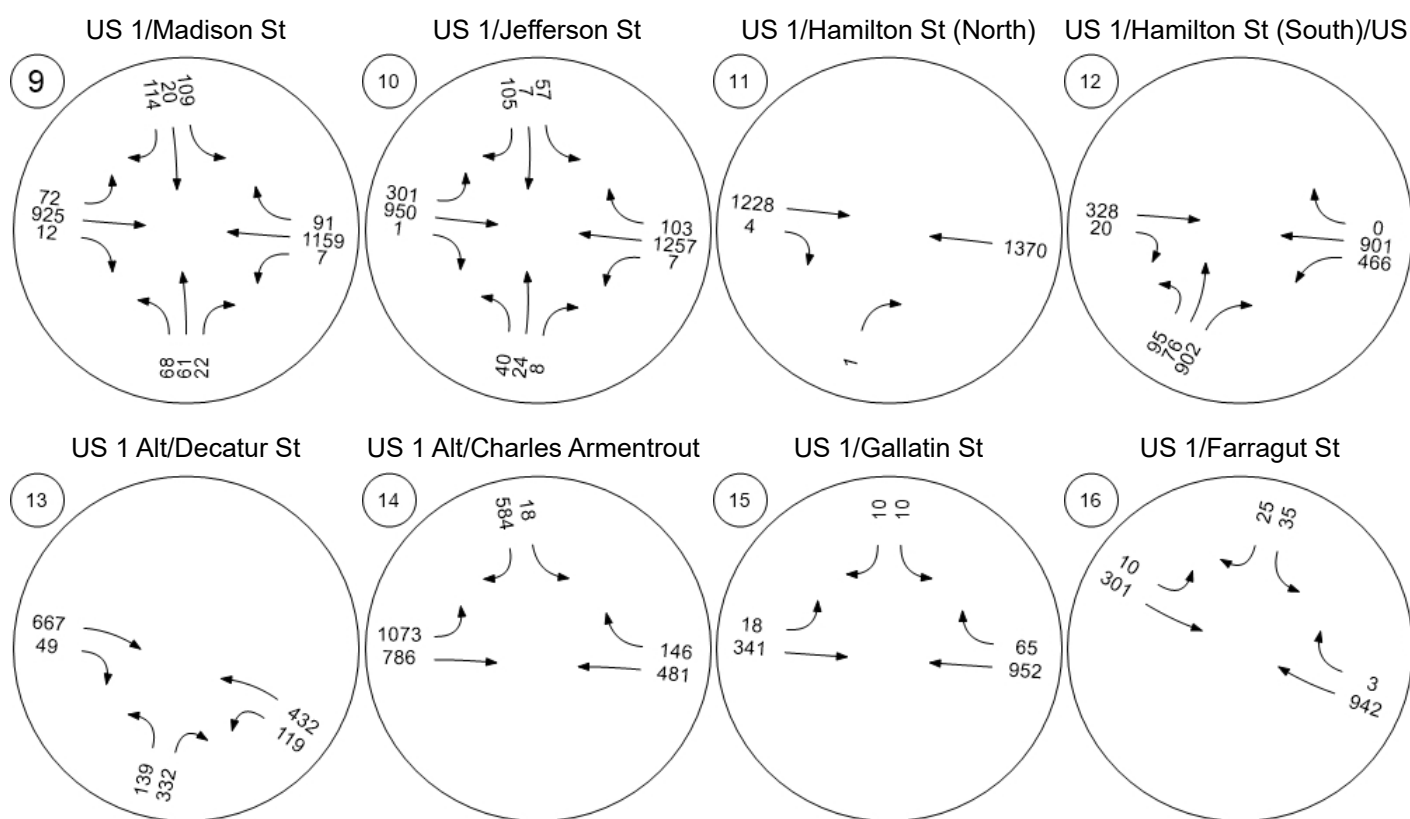


US 1/Oglethorpe Rd





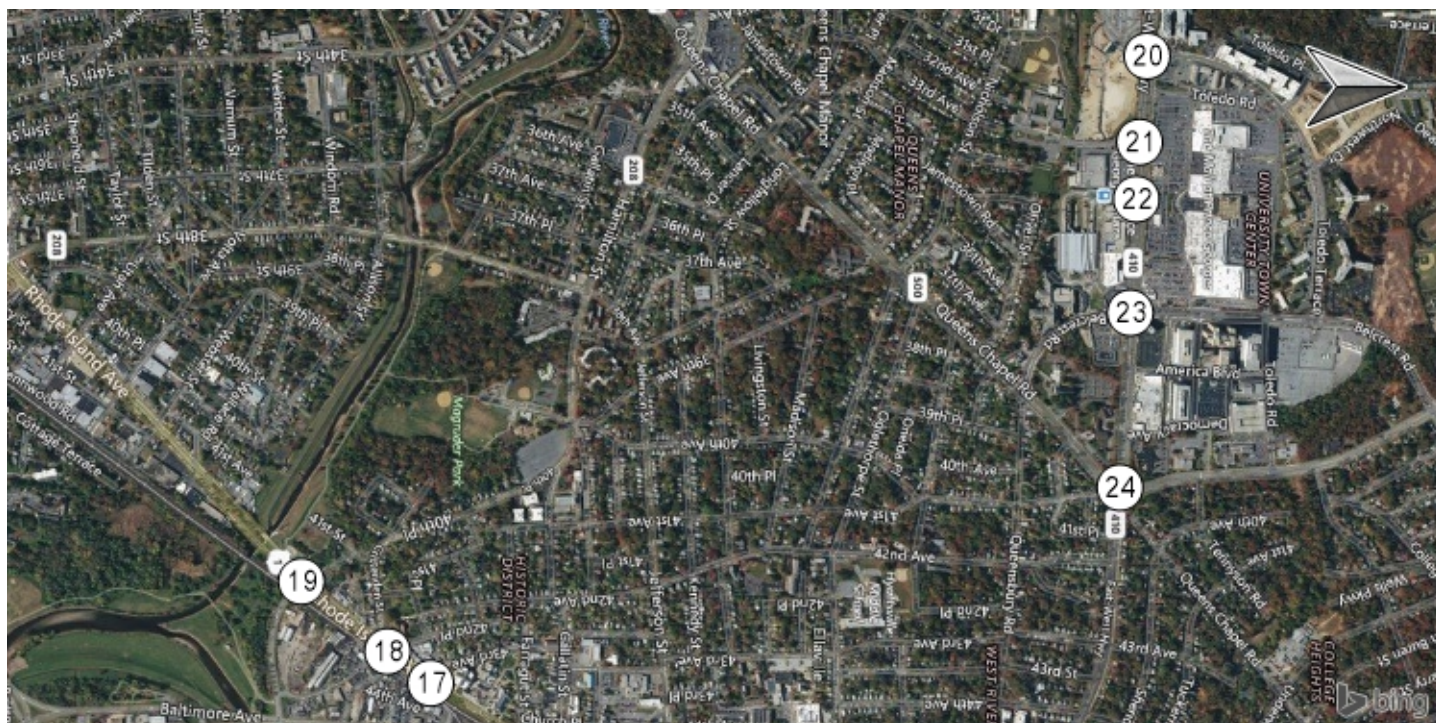
## Traffic Volume - Future Total Volume



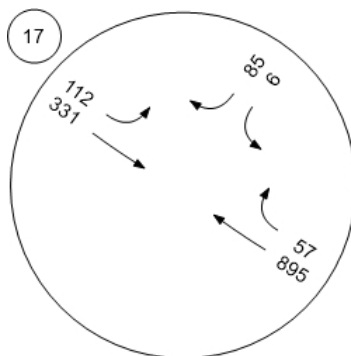


Version 6.00-00

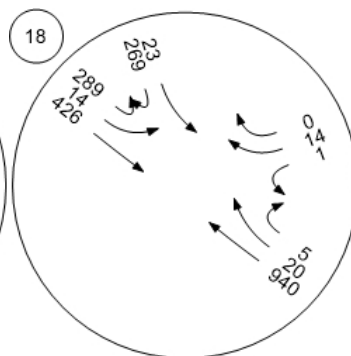
## Traffic Volume - Future Total Volume



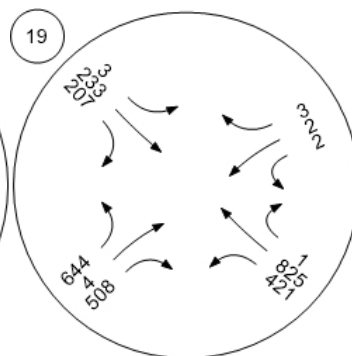
US 1/43rd Avenue



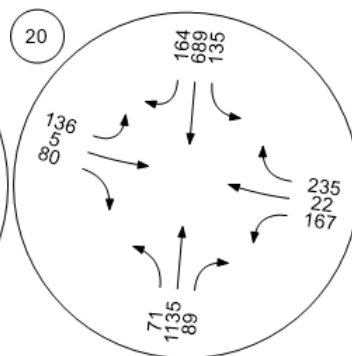
US 1/42nd Place/Crittendon



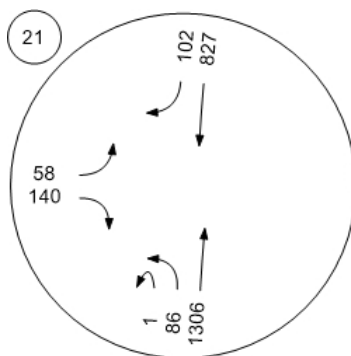
US 1/41st Place/Charles Arm



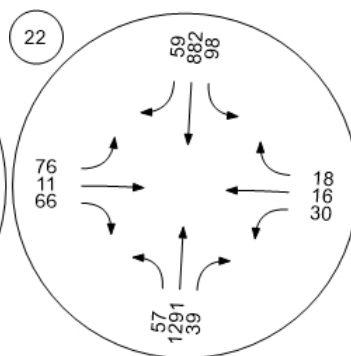
MD 410/Toledo Terrace



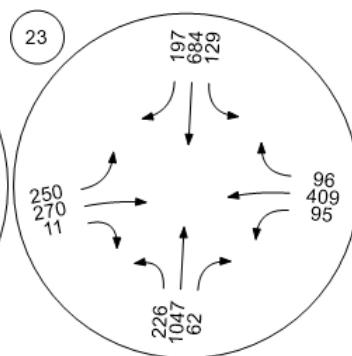
MD 410/Editors Park Dr



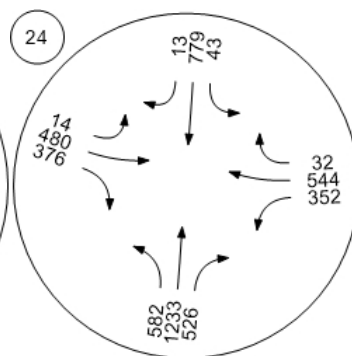
MD 410/Prince George's Plaza



MD 410/Belcrest Rd

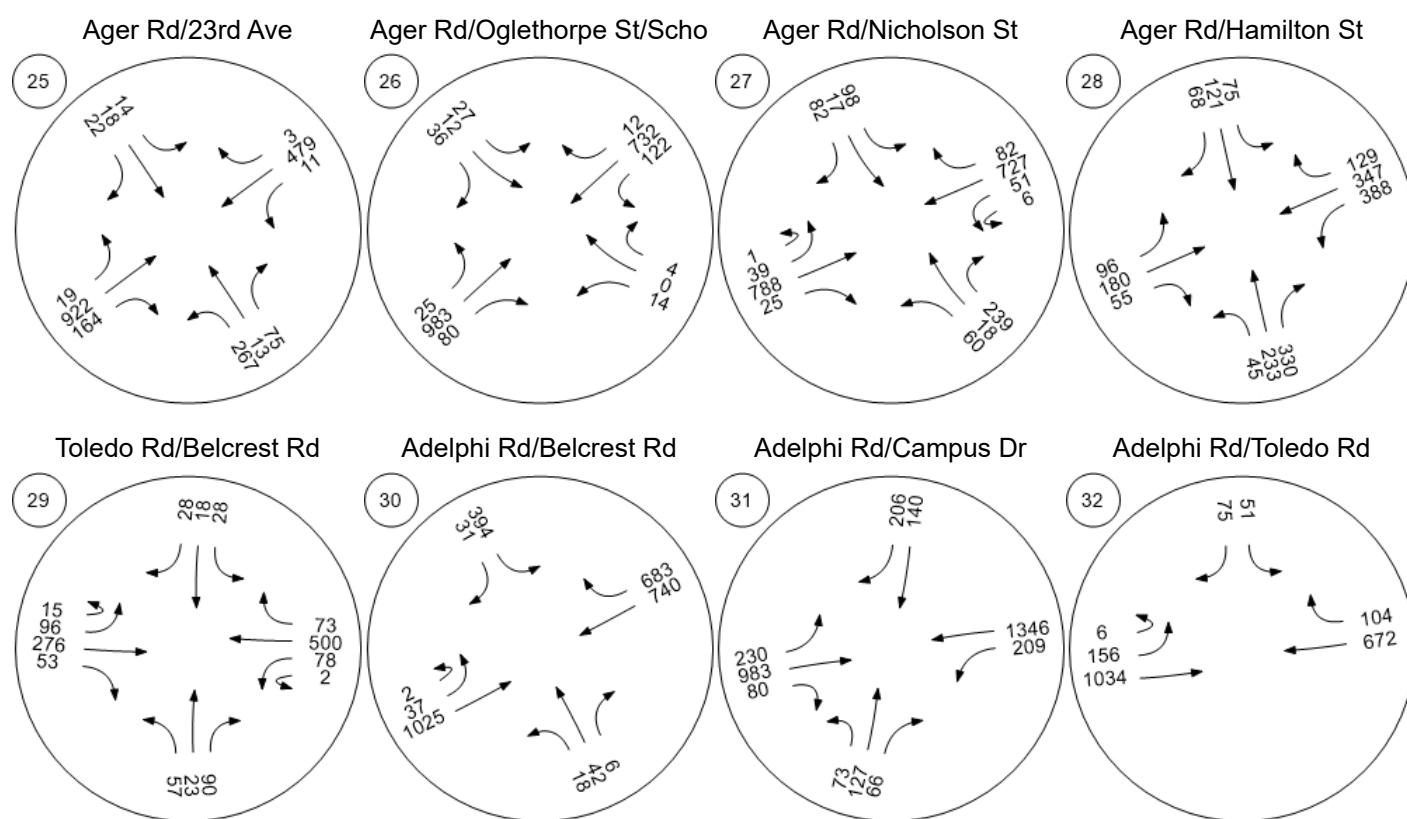
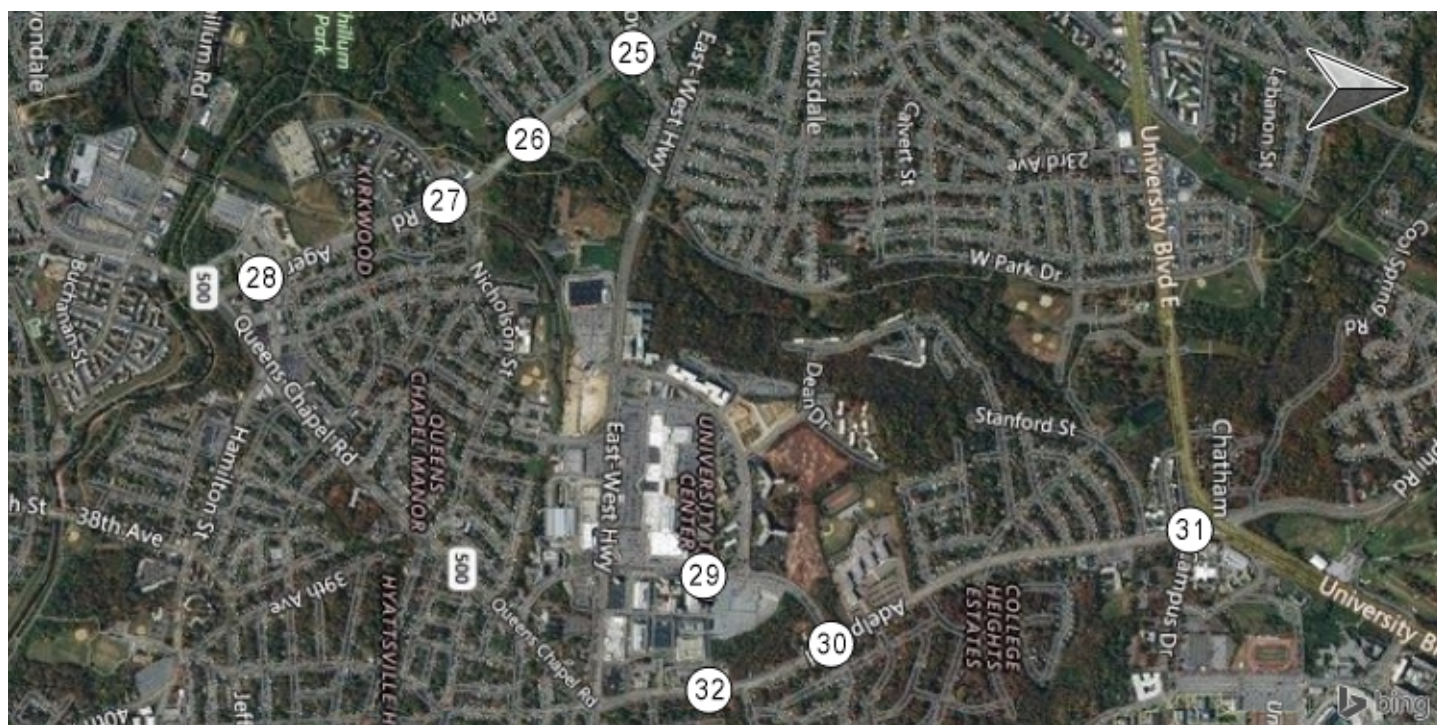


MD 410/MD 500/Adelphi Rd

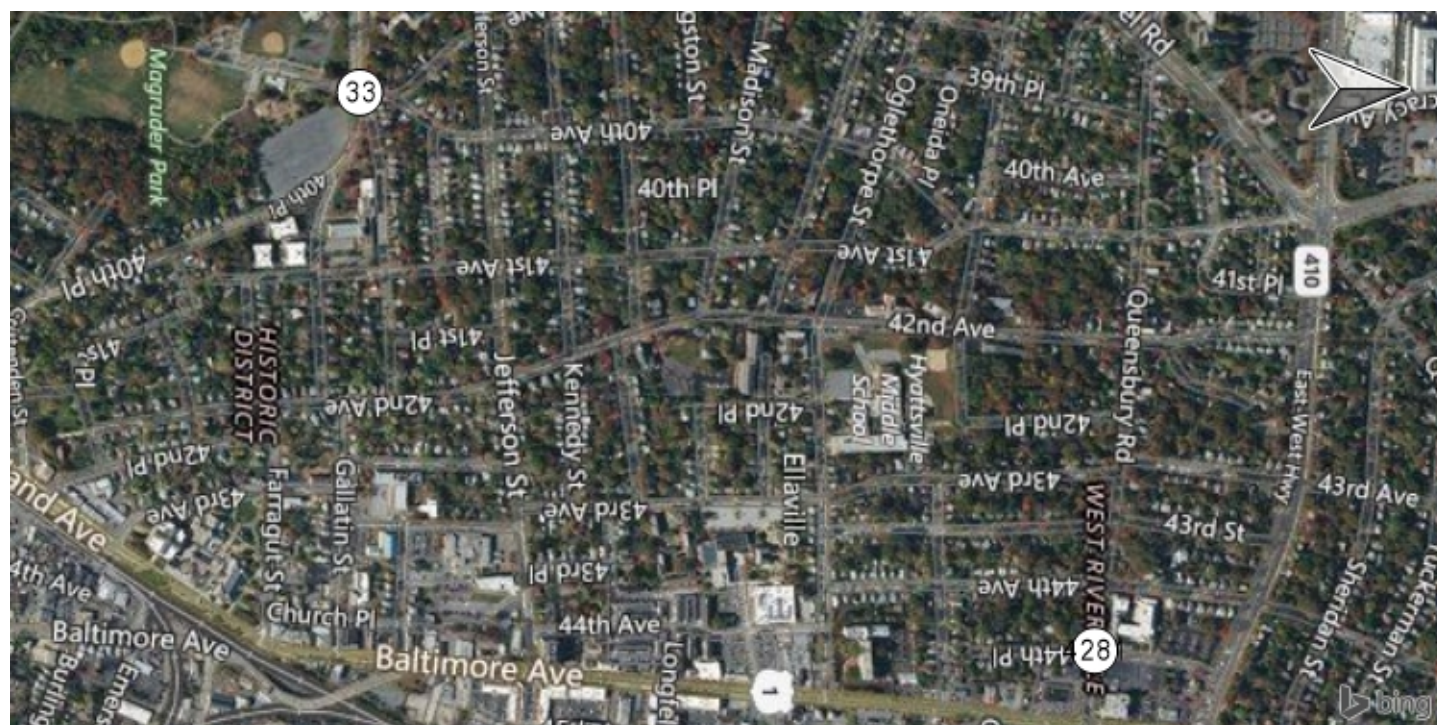




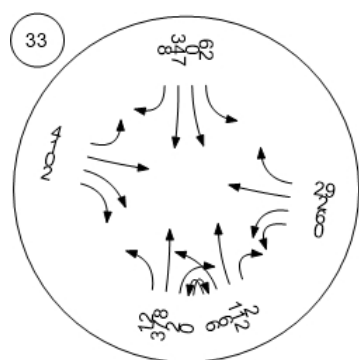
## Traffic Volume - Future Total Volume



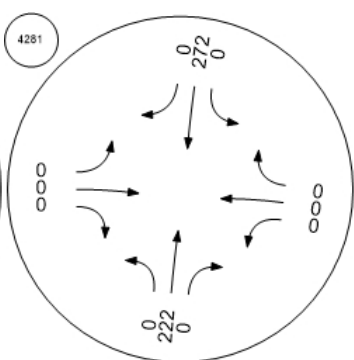
Traffic Volume - Future Total Volume



Hamilton St/40th Pl/39th Ave

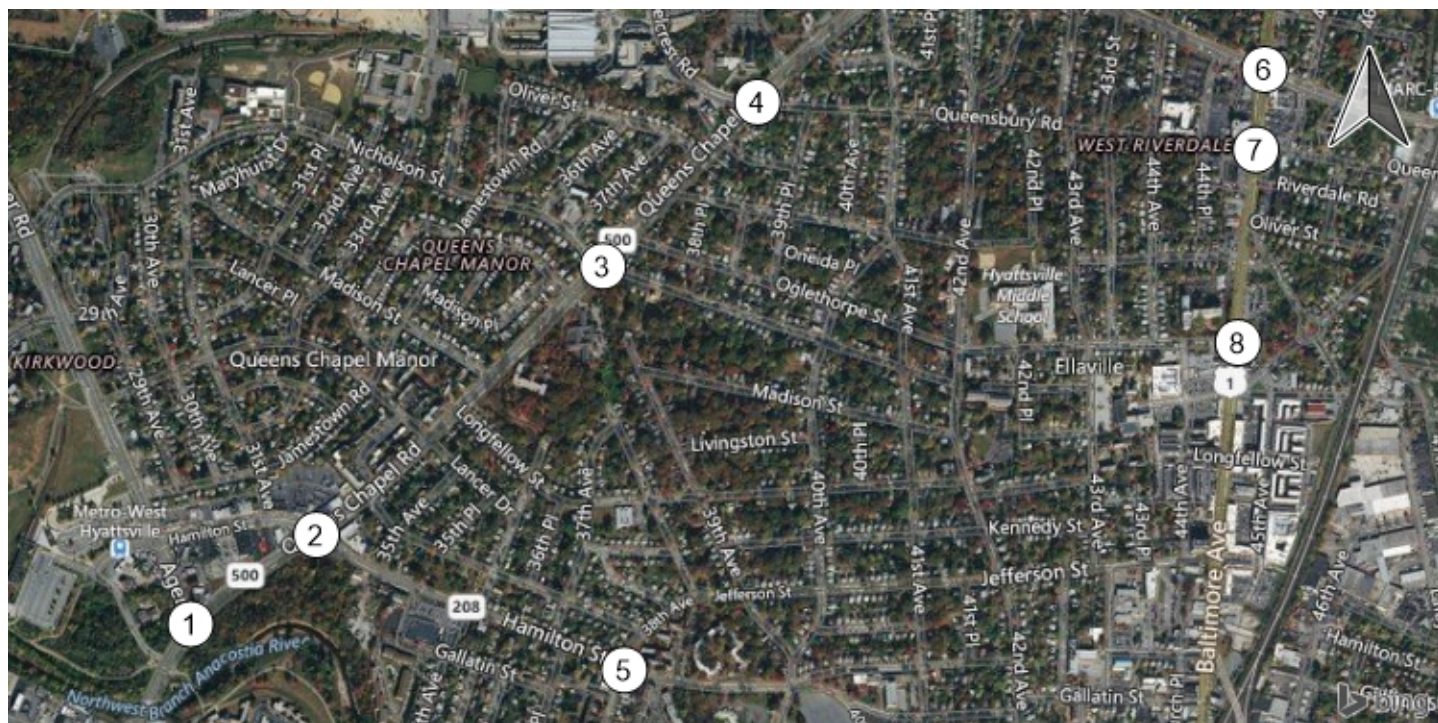


New Intersection

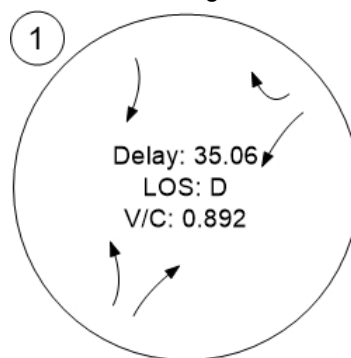




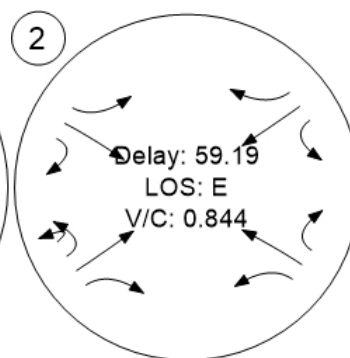
## Traffic Conditions



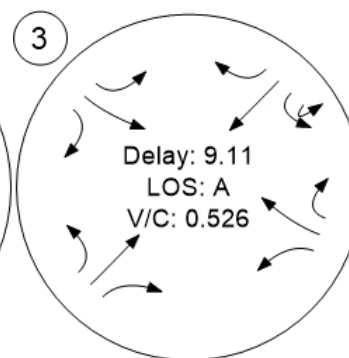
MD 500/Ager Rd



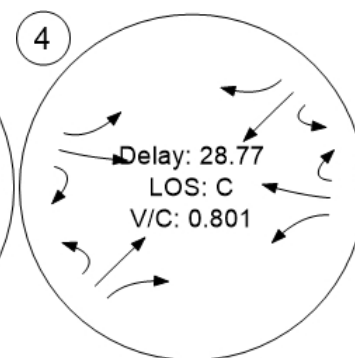
MD 500/Hamilton St



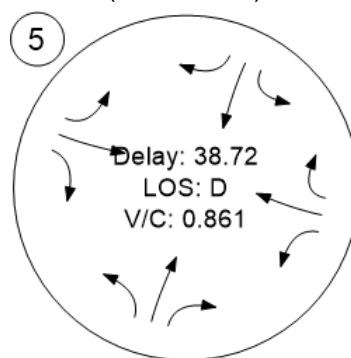
MD 500/Nicholson St



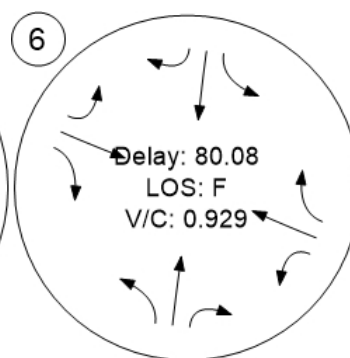
MD 500/Belcrest Rd/Queens



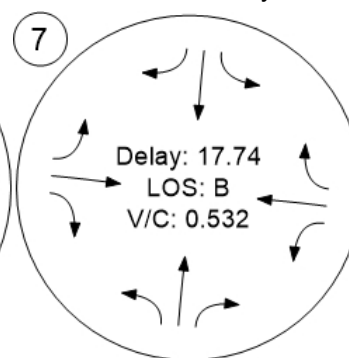
MD 208(Hamilton St)/38th Av



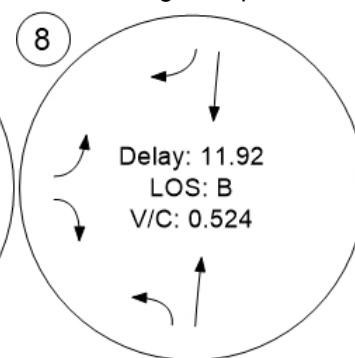
US 1/MD 410



US 1/Queensbury Rd

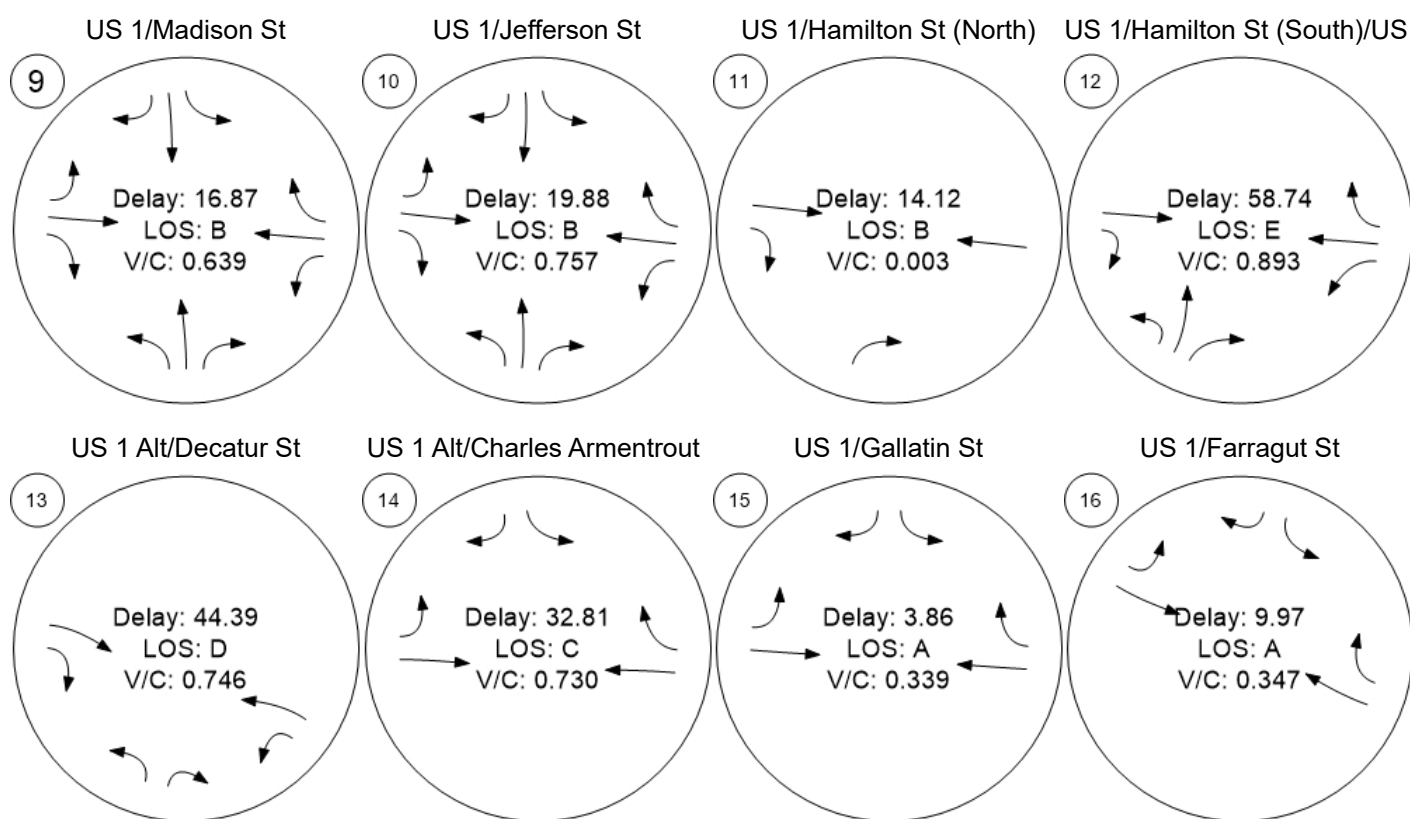
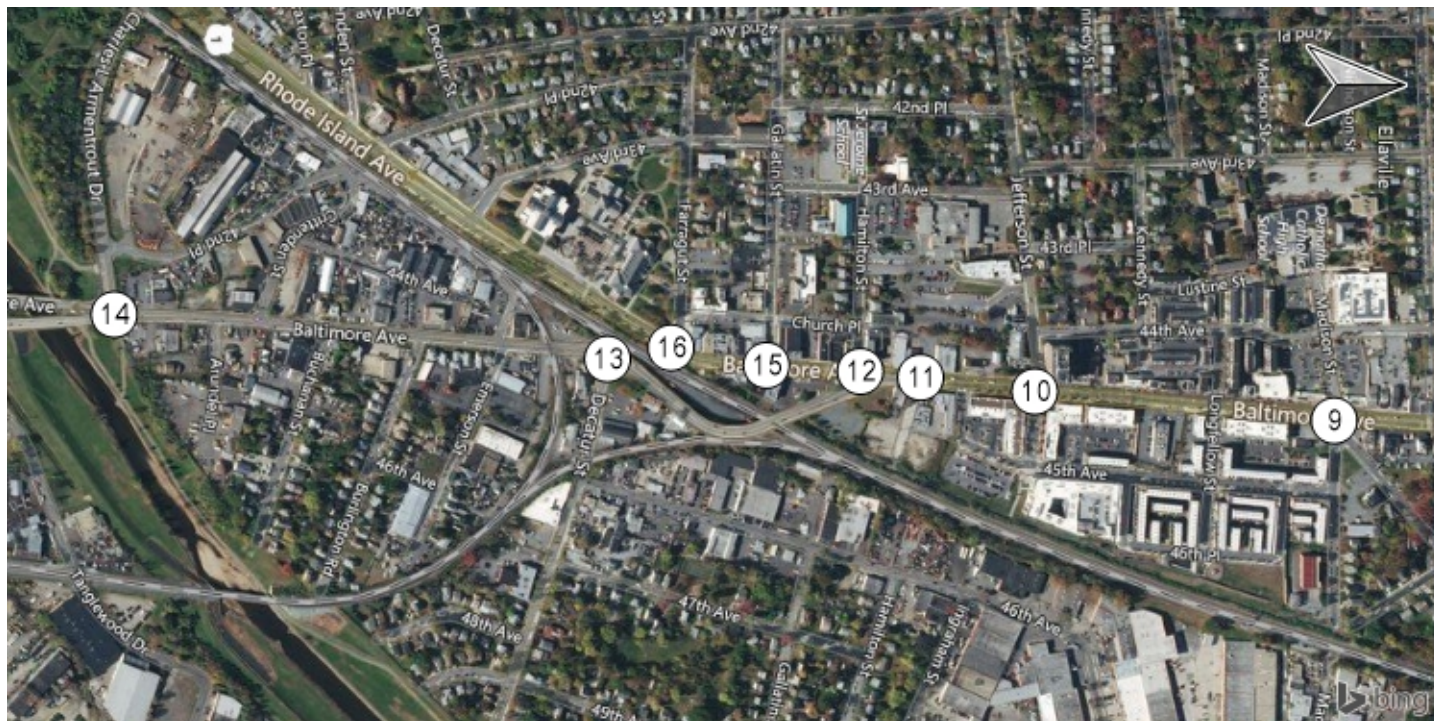


US 1/Oglethorpe Rd



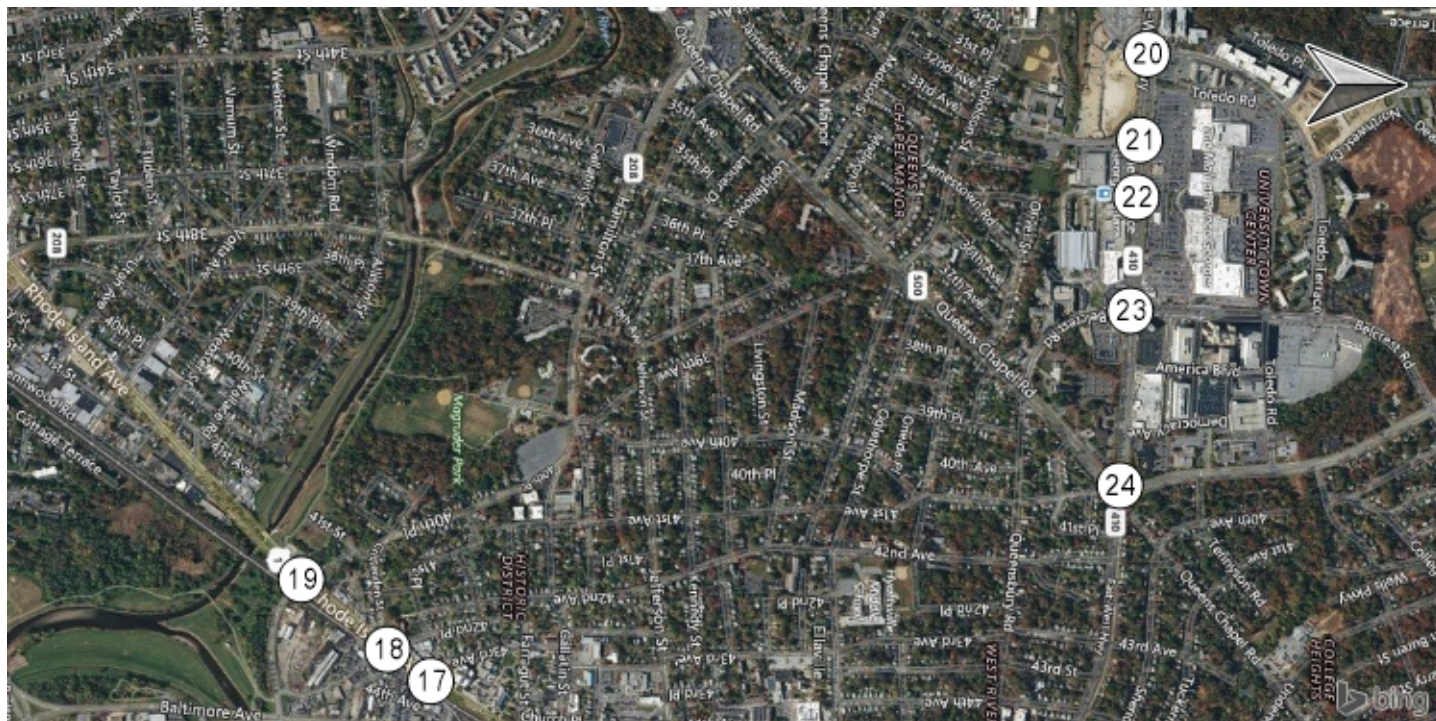


## Traffic Conditions

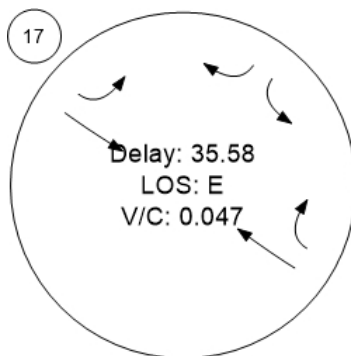




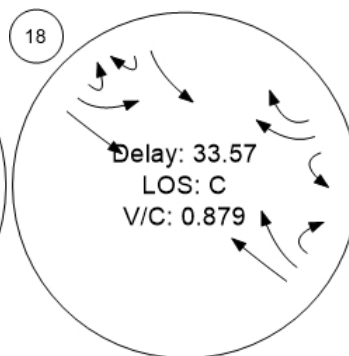
## Traffic Conditions



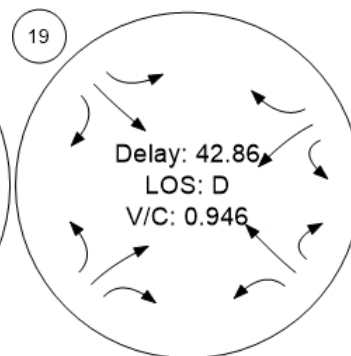
US 1/43rd Avenue



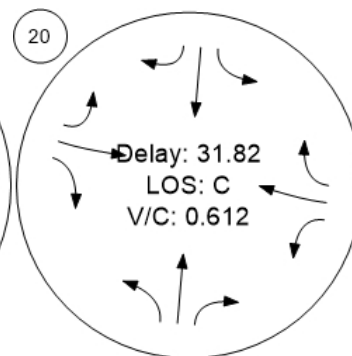
US 1/42nd Place/Crittendon



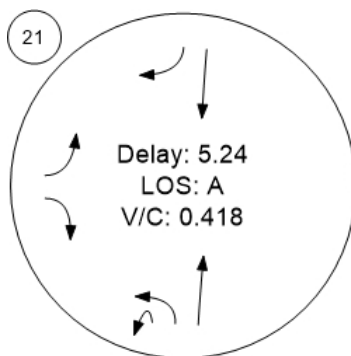
US 1/41st Place/Charles Arm



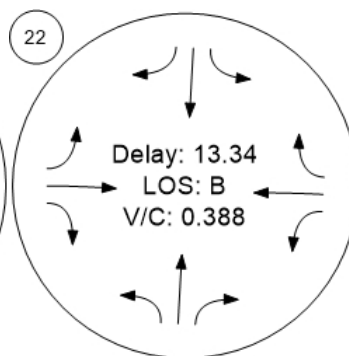
MD 410/Toledo Terrace



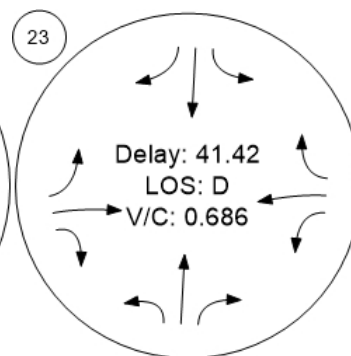
MD 410/Editors Park Dr



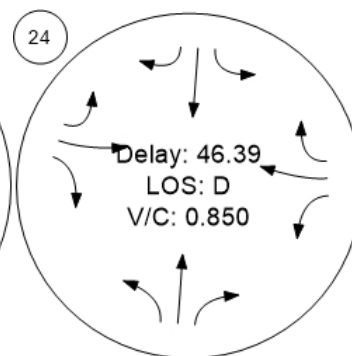
MD 410/Prince George's Plaz



MD 410/Belcrest Rd

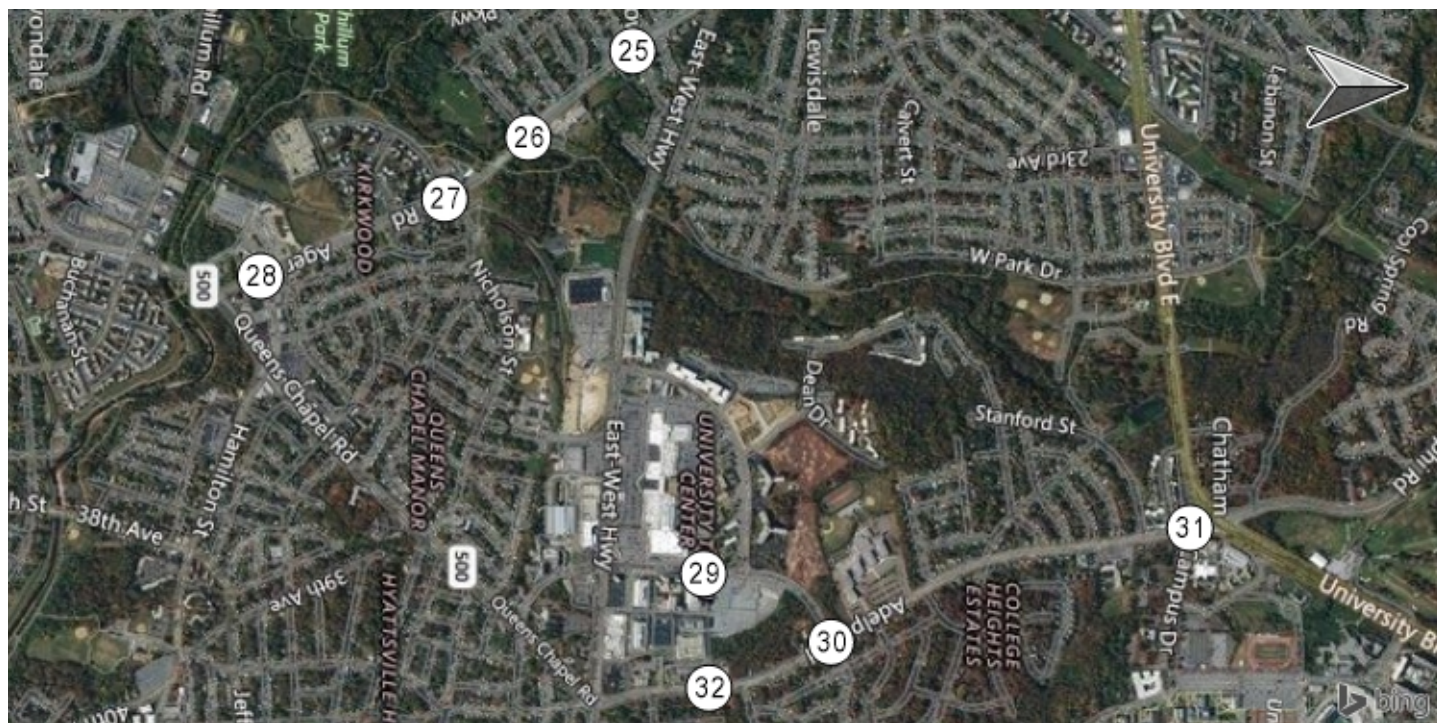


MD 410/MD 500/Adelphi Rd

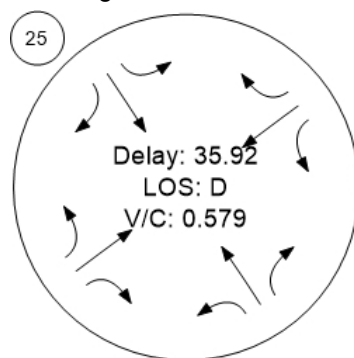




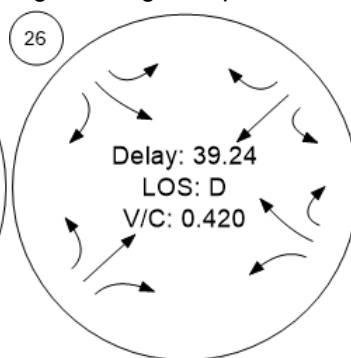
## Traffic Conditions



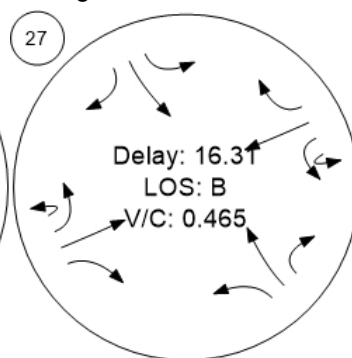
Ager Rd/23rd Ave



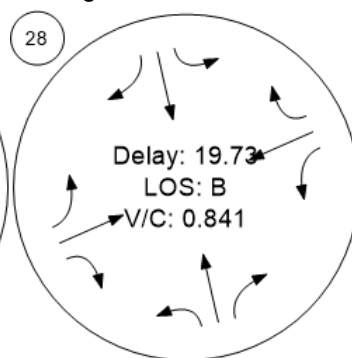
Ager Rd/Oglethorpe St/Scho



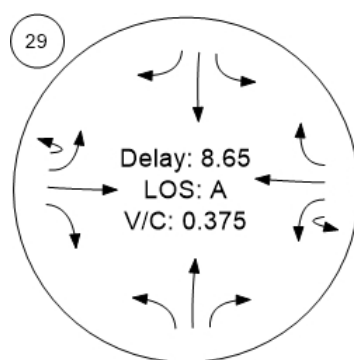
Ager Rd/Nicholson St



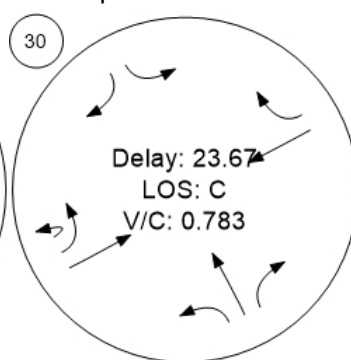
Ager Rd/Hamilton St



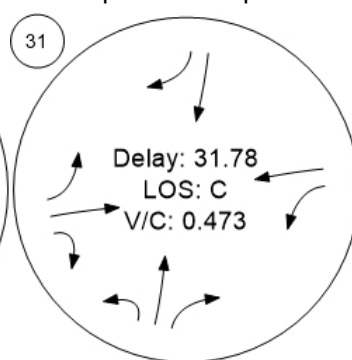
Toledo Rd/Belcrest Rd



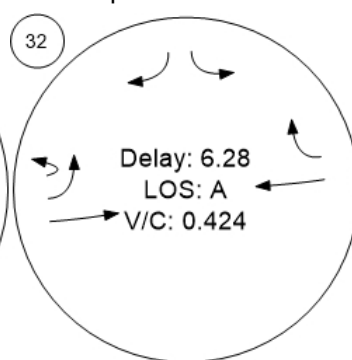
Adelphi Rd/Belcrest Rd



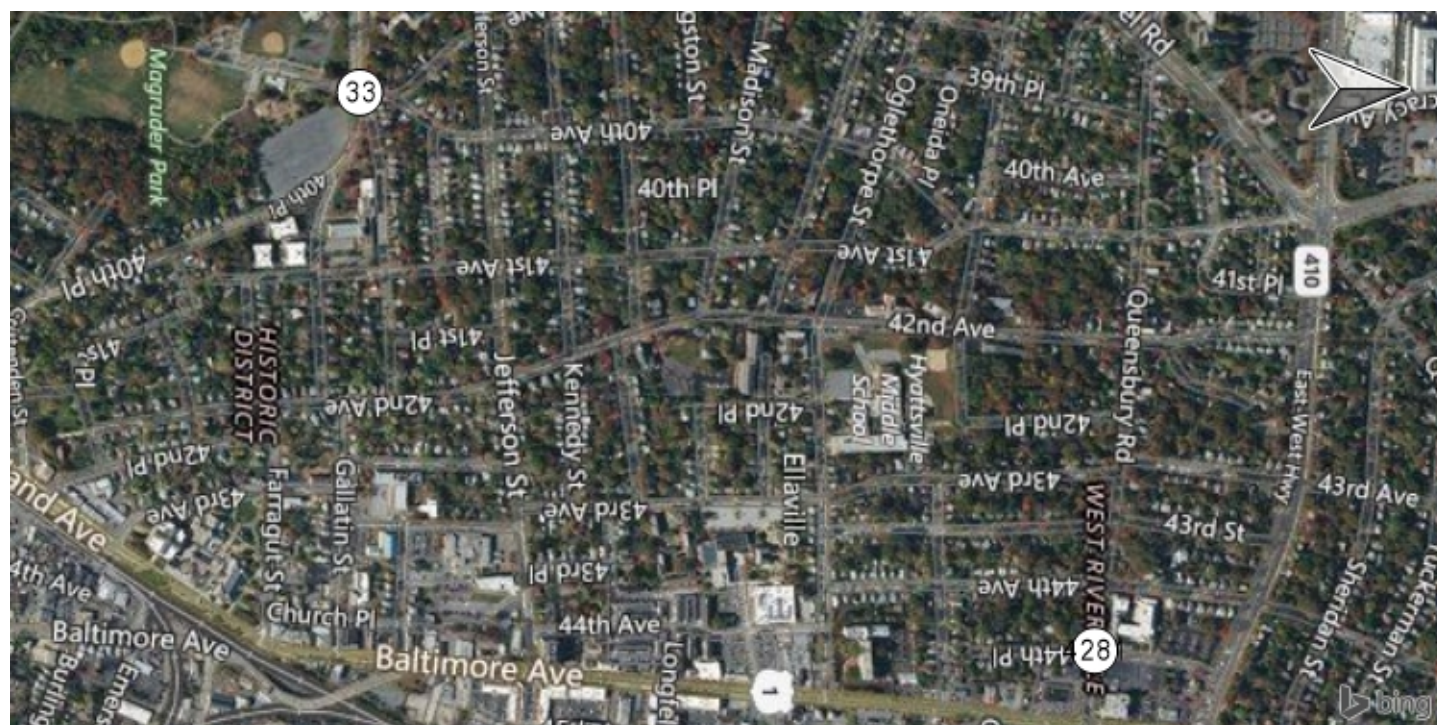
Adelphi Rd/Campus Dr



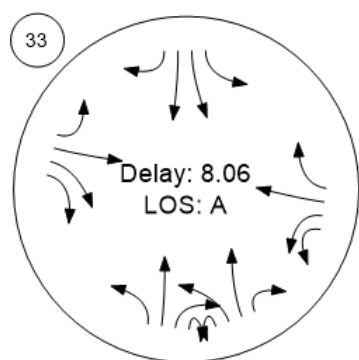
Adelphi Rd/Toledo Rd



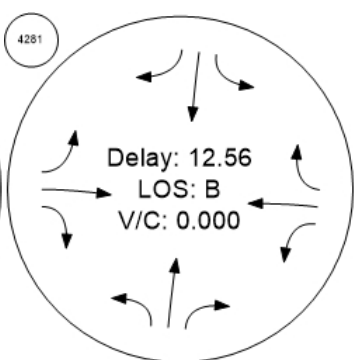
# Traffic Conditions



Hamilton St/40th Pl/39th Ave



New Intersection





Hyattsville Transportation Plan

Vistro File: K:\...\2037 AM No Build.vistro

Scenario: Base Scenario

Report File: K:\...\2037 AM\_No Build.pdf

6/21/2018

**Intersection Analysis Summary**

| ID | Intersection Name                        | Control Type | Method          | Worst Mvmt | V/C    | Delay (s/veh) | LOS |
|----|------------------------------------------|--------------|-----------------|------------|--------|---------------|-----|
| 1  | MD 500/Ager Rd                           | Signalized   | HCM 2010        | SB Right   | 0.829  | 30.8          | C   |
| 2  | MD 500/Hamilton St                       | Signalized   | HCM 2010        | SEB Thru   | 0.698  | 32.0          | C   |
| 3  | MD 500/Nicholson St                      | Signalized   | HCM 2010        | SEB Left   | 0.529  | 9.1           | A   |
| 4  | MD 500/Belcrest Rd/Queensbury Rd         | Signalized   | HCM 2010        | EB Left    | 0.564  | 21.2          | C   |
| 5  | MD 208(Hamilton St)/38th Ave             | Signalized   | HCM 2010        | SWB Right  | 0.861  | 38.7          | D   |
| 6  | US 1/MD 410                              | Signalized   | HCM 2010        | WB Left    | 0.960  | 98.9          | F   |
| 7  | US 1/Queensbury Rd                       | Signalized   | HCM 2010        | WB Left    | 0.542  | 17.8          | B   |
| 8  | US 1/Oglethorpe Rd                       | Signalized   | HCM 2010        | EB Left    | 0.535  | 12.0          | B   |
| 9  | US 1/Madison St                          | Signalized   | HCM 2010        | EB Right   | 0.649  | 16.9          | B   |
| 10 | US 1/Jefferson St                        | Signalized   | HCM 2010        | EB Right   | 0.778  | 20.4          | C   |
| 11 | US 1/Hamilton St (North)                 | Signalized   | HCM 2010        | WB Right   | 0.475  | 1.6           | A   |
| 12 | US 1/Hamilton St (South)/US 1 Alt        | Signalized   | HCM 2010        | NWB Right  | 0.941  | 312.1         | F   |
| 13 | US 1 Alt/Decatur St                      | Signalized   | HCM 2010        | WB Right   | 0.750  | 44.0          | D   |
| 14 | US 1 Alt/Charles Armentrout St           | Two-way stop | HCM 2010        | EB Left    | 0.000  | 10,000.0      | F   |
| 15 | US 1/Gallatin St                         | Signalized   | HCM 2010        | SB Right   | 0.331  | 3.7           | A   |
| 16 | US 1/Farragut St                         | Signalized   | HCM 2010        | EB Left    | 0.332  | 9.9           | A   |
| 17 | US 1/43rd Avenue                         | Two-way stop | HCM 6th Edition | SEB Left   | 0.049  | 36.3          | E   |
| 18 | US 1/42nd Place/Crittendon St            | Signalized   | HCM 2010        | NEBL2      | 0.888  | 33.3          | C   |
| 19 | US 1/41st Place/Charles Armentrout Drive | Signalized   | HCM 2010        | NEB Left   | 0.946  | 42.9          | D   |
| 20 | MD 410/Toledo Terrace                    | Signalized   | HCM 2010        | SB Left    | 32.667 | 180.1         | F   |
| 21 | MD 410/Editors Park Dr                   | Two-way stop | HCM 2010        | NB Left    | 1.214  | 383.9         | F   |
| 22 | MD 410/Prince George's Plaza             | Signalized   | HCM 2010        | NB Right   | 0.400  | 13.2          | B   |
| 23 | MD 410/Belcrest Rd                       | Signalized   | HCM 2010        | WB Left    | 0.774  | 58.7          | E   |
| 24 | MD 410/MD 500/Adelphi Rd                 | Signalized   | HCM 2010        | NEB Right  | 1.058  | 110.7         | F   |
| 25 | Ager Rd/23rd Ave                         | Signalized   | HCM 6th Edition | SWB Left   | 0.579  | 35.9          | D   |
|    | Ager Rd/Oglethorpe                       |              | HCM 6th         |            |        |               |     |

Version 6.00-00

|    |                              |              |                  |           |       |         |   |
|----|------------------------------|--------------|------------------|-----------|-------|---------|---|
| 26 | Ager Rd/Greenhope St/School  | Signalized   | HCM 2010 Edition | NWB Right | 0.420 | 39.2    | D |
| 27 | Ager Rd/Nicholson St         | Two-way stop | HCM 2010         | NEB Left  | 4.241 | 1,934.8 | F |
| 28 | Ager Rd/Hamilton St          | Signalized   | HCM 2010         | WB Right  | 0.651 | 16.3    | B |
| 29 | Toledo Rd/Belcrest Rd        | Signalized   | HCM 2010         | EB Left   | 0.375 | 8.6     | A |
| 30 | Adelphi Rd/Belcrest Rd       | Signalized   | HCM 2010         | SWB Thru  | 0.783 | 23.7    | C |
| 31 | Adelphi Rd/Campus Dr         | Signalized   | HCM 2010         | WB Left   | 0.473 | 31.8    | C |
| 32 | Adelphi Rd/Toledo Rd         | Signalized   | HCM 2010         | EB Right  | 0.424 | 6.3     | A |
| 33 | Hamilton St/40th Pl/39th Ave | All-way stop | HCM 2010         | EB Thru   | 0.658 | 15.7    | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

### Intersection Level Of Service Report

#### Intersection 1: MD 500/Ager Rd

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 30.8  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.829 |

#### Intersection Setup

| Name                   | Ager Rd.                                                                          |        | MD 500                                                                             |        | MD 500                                                                              |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Southbound                                                                        |        | Northeastbound                                                                     |        | Southwestbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Right  | Left                                                                               | Thru   | Thru                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1                                                                                  | 0      | 0                                                                                   | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 400.00                                                                             | 100.00 | 100.00                                                                              | 300.00 |
| Speed [mph]            | 35.00                                                                             |        | 40.00                                                                              |        | 40.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | No                                                                                  |        |

#### Volumes

| Name                                    | Ager Rd. |        | MD 500 |        | MD 500 |        |
|-----------------------------------------|----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 0        | 386    | 303    | 827    | 1353   | 12     |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00     | 2.00   | 2.00   | 2.00   | 2.00   | 3.85   |
| Growth Rate                             | 1.00     | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0        | 58     | 17     | 21     | 85     | 0      |
| Diverted Trips [veh/h]                  | 0        | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0        | 444    | 320    | 848    | 1438   | 12     |
| Peak Hour Factor                        | 1.0000   | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0        | 121    | 87     | 230    | 391    | 3      |
| Total Analysis Volume [veh/h]           | 0        | 483    | 348    | 922    | 1563   | 13     |
| Presence of On-Street Parking           | No       | No     | No     | No     | No     | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 9        |        | 0      |        | 0      |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0      |        | 0      |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Protected | Permissive | Split | Split |
|------------------------------|------------|------------|-----------|------------|-------|-------|
| Signal group                 | 0          | 1          | 1         | 0          | 2     | 0     |
| Auxiliary Signal Groups      |            |            |           |            |       |       |
| Lead / Lag                   | -          | -          | Lead      | -          | -     | -     |
| Minimum Green [s]            | 0          | 5          | 5         | 0          | 20    | 0     |
| Maximum Green [s]            | 0          | 43         | 43        | 0          | 66    | 0     |
| Amber [s]                    | 0.0        | 4.0        | 4.0       | 0.0        | 5.0   | 0.0   |
| All red [s]                  | 0.0        | 1.0        | 1.0       | 0.0        | 1.0   | 0.0   |
| Split [s]                    | 0          | 48         | 48        | 0          | 72    | 0     |
| Vehicle Extension [s]        | 0.0        | 3.0        | 3.0       | 0.0        | 5.0   | 0.0   |
| Walk [s]                     | 0          | 0          | 0         | 0          | 0     | 0     |
| Pedestrian Clearance [s]     | 0          | 0          | 0         | 0          | 0     | 0     |
| Rest In Walk                 |            | No         |           |            | No    |       |
| I1, Start-Up Lost Time [s]   | 0.0        | 2.0        | 2.0       | 0.0        | 2.0   | 0.0   |
| I2, Clearance Lost Time [s]  | 0.0        | 3.0        | 3.0       | 0.0        | 4.0   | 0.0   |
| Minimum Recall               |            | No         | No        |            | No    |       |
| Maximum Recall               |            | No         | No        |            | Yes   |       |
| Pedestrian Recall            |            | No         | No        |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0       | 0.0        | 230.0 | 0.0   |
| Detector Length [ft]         | 0.0        | 30.0       | 30.0      | 0.0        | 6.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00      | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 39    | 39    | 70    | 70    |
| g / C, Green / Cycle                    | 0.33  | 0.33  | 0.58  | 0.58  |
| (v / s)_i Volume / Saturation Flow Rate | 0.31  | 0.20  | 0.44  | 0.01  |
| s, saturation flow rate [veh/h]         | 1583  | 1774  | 3547  | 1548  |
| c, Capacity [veh/h]                     | 519   | 581   | 2060  | 899   |
| d1, Uniform Delay [s]                   | 39.03 | 33.74 | 18.86 | 10.64 |
| k, delay calibration                    | 0.34  | 0.12  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 19.55 | 1.08  | 2.68  | 0.03  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |       |
|---------------------------------------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.93   | 0.60   | 0.76   | 0.01  |
| d, Delay for Lane Group [s/veh]       | 58.58  | 34.82  | 21.55  | 10.67 |
| Lane Group LOS                        | E      | C      | C      | B     |
| Critical Lane Group                   | Yes    | No     | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 16.25  | 8.44   | 15.60  | 0.15  |
| 50th-Percentile Queue Length [ft/ln]  | 406.21 | 211.06 | 389.98 | 3.66  |
| 95th-Percentile Queue Length [veh/ln] | 22.86  | 13.21  | 22.08  | 0.26  |
| 95th-Percentile Queue Length [ft/ln]  | 571.48 | 330.18 | 551.92 | 6.59  |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |      |       |       |
|---------------------------------|-------|-------|-------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 0.00  | 58.58 | 34.82 | 0.00 | 21.55 | 10.67 |
| Movement LOS                    |       | E     | C     |      | C     | B     |
| d_A, Approach Delay [s/veh]     | 58.58 |       | 34.82 |      | 21.46 |       |
| Approach LOS                    | E     |       | C     |      | C     |       |
| d_I, Intersection Delay [s/veh] | 30.84 |       |       |      |       |       |
| Intersection LOS                | C     |       |       |      |       |       |
| Intersection V/C                | 0.829 |       |       |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 1 48s

SG: 2 72s

### Intersection Level Of Service Report

#### Intersection 2: MD 500/Hamilton St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 32.0  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.698

#### Intersection Setup

| Name                   | MD 500                                                                            |       |       |       | MD 500                                                                            |        |        | Hamilton St                                                                         |        |        | Hamilton St                                                                         |        |       |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|-------|
| Approach               | Northeastbound                                                                    |       |       |       | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |       |
| Lane Configuration     |  |       |       |       |  |        |        |  |        |        |  |        |       |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00 |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 1     | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1     |
| Pocket Length [ft]     | 200.0                                                                             | 100.0 | 100.0 | 200.0 | 220.00                                                                            | 100.00 | 200.00 | 200.00                                                                              | 100.00 | 100.00 | 180.00                                                                              | 100.00 | 50.00 |
| Speed [mph]            | 40.00                                                                             |       |       |       | 40.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |       |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |       |
| Crosswalk              | Yes                                                                               |       |       |       | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |       |

#### Volumes

| Name                                    | MD 500 |       |       |       | MD 500 |        |        | Hamilton St |        |        | Hamilton St |        |        |
|-----------------------------------------|--------|-------|-------|-------|--------|--------|--------|-------------|--------|--------|-------------|--------|--------|
| Base Volume Input [veh/h]               | 2      | 23    | 608   | 128   | 95     | 949    | 89     | 302         | 420    | 89     | 110         | 378    | 31     |
| Base Volume Adjustment Factor           | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 0.00  | 2.00  | 2.63  | 2.00   | 2.00   | 2.63   | 2.27        | 2.11   | 2.00   | 2.00        | 2.27   | 3.85   |
| Growth Rate                             | 1.00   | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0     | 21    | 0     | 22     | 85     | 13     | 0           | 10     | 5      | 47          | 35     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Total Hourly Volume [veh/h]             | 2      | 23    | 629   | 128   | 117    | 1034   | 102    | 302         | 430    | 94     | 157         | 413    | 31     |
| Peak Hour Factor                        | 0.920  | 0.920 | 0.920 | 0.920 | 0.9200 | 0.9200 | 0.9200 | 0.9200      | 0.9200 | 0.9200 | 0.9200      | 0.9200 | 0.9200 |
| Other Adjustment Factor                 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1      | 6     | 171   | 35    | 32     | 281    | 28     | 82          | 117    | 26     | 43          | 112    | 8      |
| Total Analysis Volume [veh/h]           | 2      | 25    | 684   | 139   | 127    | 1124   | 111    | 328         | 467    | 102    | 171         | 449    | 34     |
| Presence of On-Street Parking           | No     |       |       | No    | No     |        | No     | No          |        | No     | No          |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |       |       |       | 0      |        |        | 0           |        |        | 0           |        |        |
| Bicycle Volume [bicycles/h]             | 0      |       |       |       | 0      |        |        | 0           |        |        | 0           |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 16.00                           |

**Phasing & Timing**

| Control Type                 | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 1     | 1     | 6     | 6     | 5        | 2       | 2       | 3        | 8       | 8       | 7        | 4       | 4       |
| Auxiliary Signal Groups      |       |       |       |       |          |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lead  | Lead  | -     | -     | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 20    | 20    | 5        | 20      | 20      | 5        | 5       | 5       | 5        | 5       | 5       |
| Maximum Green [s]            | 13    | 13    | 42    | 42    | 30       | 42      | 42      | 19       | 25      | 25      | 19       | 25      | 25      |
| Amber [s]                    | 4.0   | 4.0   | 5.0   | 5.0   | 4.0      | 5.0     | 5.0     | 4.0      | 4.0     | 4.0     | 4.0      | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 1.0   | 1.0      | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     |
| Split [s]                    | 18    | 18    | 48    | 48    | 18       | 48      | 48      | 24       | 30      | 30      | 24       | 30      | 30      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 5.0   | 5.0   | 3.0      | 5.0     | 5.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       |       | No    |       |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 4.0   | 4.0   | 3.0      | 4.0     | 4.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Minimum Recall               |       | No    | No    |       | No       | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    | Yes   |       | No       | Yes     |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |       | No    | No    |       | No       | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 5.0   | 5.0   | 5.0      | 5.0     | 5.0     | 30.0     | 30.0    | 30.0    | 30.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | C     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 4.00  | 4.00  | 0.00  | 4.00  | 4.00  | 0.00  | 3.00  | 3.00  | 0.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 67    | 55    | 55    | 67    | 59    | 59    | 42    | 27    | 27    | 42    | 18    | 18    |
| g / C, Green / Cycle                    | 0.56  | 0.46  | 0.46  | 0.56  | 0.49  | 0.49  | 0.35  | 0.22  | 0.22  | 0.35  | 0.15  | 0.15  |
| (v / s)_i Volume / Saturation Flow Rate | 0.04  | 0.19  | 0.09  | 0.14  | 0.32  | 0.07  | 0.24  | 0.16  | 0.16  | 0.15  | 0.13  | 0.02  |
| s, saturation flow rate [veh/h]         | 626   | 3547  | 1574  | 899   | 3547  | 1574  | 1369  | 1861  | 1747  | 1140  | 3537  | 1555  |
| c, Capacity [veh/h]                     | 316   | 1633  | 725   | 489   | 1735  | 770   | 458   | 414   | 389   | 368   | 540   | 237   |
| d1, Uniform Delay [s]                   | 15.67 | 21.64 | 19.16 | 14.03 | 22.94 | 16.86 | 32.24 | 43.08 | 43.09 | 29.47 | 49.37 | 44.06 |
| k, delay calibration                    | 0.11  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.12  | 0.12  | 0.22  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.11  | 0.79  | 0.59  | 1.29  | 1.89  | 0.39  | 9.28  | 2.59  | 2.76  | 1.85  | 3.40  | 0.27  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |       |        |        |        |        |        |       |
|---------------------------------------|-------|--------|--------|-------|--------|-------|--------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.09  | 0.42   | 0.19   | 0.26  | 0.65   | 0.14  | 0.72   | 0.71   | 0.71   | 0.46   | 0.83   | 0.14  |
| d, Delay for Lane Group [s/veh]       | 15.79 | 22.44  | 19.75  | 15.32 | 24.83  | 17.25 | 41.51  | 45.67  | 45.84  | 31.32  | 52.77  | 44.34 |
| Lane Group LOS                        | B     | C      | B      | B     | C      | B     | D      | D      | D      | C      | D      | D     |
| Critical Lane Group                   | Yes   | No     | No     | No    | Yes    | No    | Yes    | No     | No     | No     | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.32  | 6.38   | 2.35   | 1.74  | 11.72  | 1.72  | 8.62   | 8.24   | 7.76   | 3.69   | 6.72   | 0.89  |
| 50th-Percentile Queue Length [ft/ln]  | 8.11  | 159.49 | 58.74  | 43.59 | 292.93 | 42.97 | 215.51 | 206.10 | 194.01 | 92.17  | 168.03 | 22.30 |
| 95th-Percentile Queue Length [veh/ln] | 0.58  | 10.52  | 4.23   | 3.14  | 17.33  | 3.09  | 13.44  | 12.95  | 12.33  | 6.64   | 10.97  | 1.61  |
| 95th-Percentile Queue Length [ft/ln]  | 14.60 | 263.05 | 105.72 | 78.47 | 433.27 | 77.35 | 335.89 | 323.82 | 308.23 | 165.90 | 274.32 | 40.15 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 15.79 | 15.79 | 22.44 | 19.75 | 15.32 | 24.83 | 17.25 | 41.51 | 45.73 | 45.84 | 31.32 | 52.77 | 44.34 |
| Movement LOS                    | B     | B     | C     | B     | B     | C     | B     | D     | D     | D     | C     | D     | D     |
| d_A, Approach Delay [s/veh]     | 21.79 |       |       |       | 23.32 |       |       | 44.20 |       |       | 46.72 |       |       |
| Approach LOS                    | C     |       |       |       | C     |       |       | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 32.02 |       |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.698 |       |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 3: MD 500/Nicholson St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 9.1  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.529

#### Intersection Setup

| Name                   | Nicholson St                                                                      |        |        | MD 500                                                                            |        |        | MD 500                                                                              |       |       |       | Nicholson St                                                                        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Westbound                                                                         |        |        | Northeastbound                                                                    |        |        | Southwestbound                                                                      |       |       |       | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |       |       |       |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0     | 0     | 0     | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 150.00                                                                            | 100.00 | 100.00 | 150.0                                                                               | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |       |       |       | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |       |       |       | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |       |       |       | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Nicholson St |        |        | MD 500 |        |        | MD 500 |       |       |       | Nicholson St |        |        |
|-----------------------------------------|--------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 15           | 59     | 26     | 48     | 912    | 10     | 1      | 11    | 1111  | 84    | 100          | 10     | 18     |
| Base Volume Adjustment Factor           | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00         | 0.00   | 0.00   | 0.00   | 2.00   | 0.00   | 0.00   | 0.00  | 2.00  | 0.00  | 2.27         | 0.00   | 0.00   |
| Growth Rate                             | 1.00         | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00         | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0            | 0      | 0      | 0      | 73     | 0      | 0      | 0     | 120   | 0     | 0            | 0      | 0      |
| Diverted Trips [veh/h]                  | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 15           | 59     | 26     | 48     | 985    | 10     | 1      | 11    | 1231  | 84    | 100          | 10     | 18     |
| Peak Hour Factor                        | 0.9000       | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.900  | 0.900 | 0.900 | 0.900 | 0.9000       | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4            | 16     | 7      | 13     | 274    | 3      | 0      | 3     | 342   | 23    | 28           | 3      | 5      |
| Total Analysis Volume [veh/h]           | 17           | 66     | 29     | 53     | 1094   | 11     | 1      | 12    | 1368  | 93    | 111          | 11     | 20     |
| Presence of On-Street Parking           | No           |        | No     | No     |        | No     | No     |       |       | No    | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0            |        |        | 0      |        |        | 0      |       |       |       | 0            |        |        |
| Bicycle Volume [bicycles/h]             | 0            |        |        | 0      |        |        | 0      |       |       |       | 0            |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permi | Prote | Permi | Permi | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|----------|---------|---------|-------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 5        | 2       | 0       | 0     | 1     | 6     | 0     | 0       | 8       | 0       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |       |       |       |       |         |         |         |
| Lead / Lag                   | -       | -       | -       | Lead     | -       | -       | -     | Lead  | -     | -     | -       | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 5        | 5       | 0       | 0     | 5     | 5     | 0     | 0       | 5       | 0       |
| Maximum Green [s]            | 0       | 30      | 0       | 30       | 30      | 0       | 0     | 30    | 30    | 0     | 0       | 30      | 0       |
| Amber [s]                    | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 0.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     | 0.0   | 1.0   | 1.0   | 0.0   | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 0       | 25      | 0       | 10       | 85      | 0       | 0     | 10    | 85    | 0     | 0       | 25      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 0.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0       | 5       | 0       | 0        | 5       | 0       | 0     | 0     | 5     | 0     | 0       | 5       | 0       |
| Pedestrian Clearance [s]     | 0       | 10      | 0       | 0        | 10      | 0       | 0     | 0     | 10    | 0     | 0       | 10      | 0       |
| Rest In Walk                 |         | No      |         |          | No      |         |       |       | No    |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 0.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 0.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     |
| Minimum Recall               |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Maximum Recall               |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Pedestrian Recall            |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L    | C    | C    | L    | C    | C    | C     |
|-----------------------------------------|-------|------|------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 39    | 39   | 39   | 39   | 39   | 39   | 39   | 39    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00  |
| g_i, Effective Green Time [s]           | 5     | 25   | 21   | 21   | 25   | 19   | 19   | 5     |
| g / C, Green / Cycle                    | 0.14  | 0.65 | 0.53 | 0.53 | 0.65 | 0.49 | 0.49 | 0.14  |
| (v / s)_i Volume / Saturation Flow Rate | 0.06  | 0.09 | 0.30 | 0.30 | 0.02 | 0.40 | 0.40 | 0.12  |
| s, saturation flow rate [veh/h]         | 1836  | 609  | 1863 | 1856 | 655  | 1863 | 1821 | 1203  |
| c, Capacity [veh/h]                     | 367   | 553  | 991  | 988  | 606  | 917  | 897  | 335   |
| d1, Uniform Delay [s]                   | 15.26 | 4.92 | 6.05 | 6.05 | 3.09 | 8.28 | 8.31 | 16.31 |
| k, delay calibration                    | 0.11  | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 0.47  | 0.07 | 0.49 | 0.50 | 0.01 | 1.70 | 1.79 | 0.85  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |      |       |       |      |        |        |       |
|---------------------------------------|-------|------|-------|-------|------|--------|--------|-------|
| X, volume / capacity                  | 0.31  | 0.10 | 0.56  | 0.56  | 0.02 | 0.80   | 0.81   | 0.42  |
| d, Delay for Lane Group [s/veh]       | 15.72 | 4.99 | 6.55  | 6.55  | 3.11 | 9.98   | 10.10  | 17.16 |
| Lane Group LOS                        | B     | A    | A     | A     | A    | A      | B      | B     |
| Critical Lane Group                   | No    | Yes  | No    | No    | No   | No     | Yes    | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 0.81  | 0.06 | 1.83  | 1.83  | 0.01 | 3.58   | 3.55   | 1.11  |
| 50th-Percentile Queue Length [ft/ln]  | 20.14 | 1.46 | 45.87 | 45.73 | 0.34 | 89.49  | 88.82  | 27.70 |
| 95th-Percentile Queue Length [veh/ln] | 1.45  | 0.11 | 3.30  | 3.29  | 0.02 | 6.44   | 6.39   | 1.99  |
| 95th-Percentile Queue Length [ft/ln]  | 36.25 | 2.63 | 82.57 | 82.31 | 0.61 | 161.08 | 159.87 | 49.86 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |      |      |      |      |      |       |       |       |       |       |
|---------------------------------|-------|-------|-------|------|------|------|------|------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 15.72 | 15.72 | 15.72 | 4.99 | 6.55 | 6.55 | 3.11 | 3.11 | 10.03 | 10.10 | 17.16 | 17.16 | 17.16 |
| Movement LOS                    | B     | B     | B     | A    | A    | A    | A    | A    | B     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 15.72 |       |       | 6.47 |      |      | 9.98 |      |       | 17.16 |       |       |       |
| Approach LOS                    | B     |       |       | A    |      |      | A    |      |       | B     |       |       |       |
| d_I, Intersection Delay [s/veh] | 9.15  |       |       |      |      |      |      |      |       |       |       |       |       |
| Intersection LOS                | A     |       |       |      |      |      |      |      |       |       |       |       |       |
| Intersection V/C                | 0.529 |       |       |      |      |      |      |      |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 4: MD 500/Belcrest Rd/Queensbury Rd

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 21.2  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.564 |

#### Intersection Setup

| Name                   | Belcrest Road                                                                     |        |        | Queensbury Road                                                                   |        |        | MD 500                                                                              |        |        | MD 500                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Eastbound                                                                         |        |        | Westbound                                                                         |        |        | Northeastbound                                                                      |        |        | Southwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 375.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Road |        |        | Queensbury Road |        |        | MD 500 |        |        | MD 500 |        |        |
|-----------------------------------------|---------------|--------|--------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 61            | 121    | 416    | 38              | 184    | 35     | 349    | 697    | 39     | 27     | 738    | 64     |
| Base Volume Adjustment Factor           | 1.0000        | 1.0000 | 1.0000 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85          | 2.38   | 2.21   | 3.85            | 2.38   | 3.85   | 2.21   | 2.08   | 2.78   | 3.70   | 1.97   | 0.00   |
| Growth Rate                             | 1.00          | 1.00   | 1.00   | 1.00            | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0             | 0      | 107    | 0               | 0      | 0      | 18     | 55     | 0      | 0      | 13     | 0      |
| Diverted Trips [veh/h]                  | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 61            | 121    | 523    | 38              | 184    | 35     | 367    | 752    | 39     | 27     | 751    | 64     |
| Peak Hour Factor                        | 0.9000        | 0.9000 | 0.9000 | 0.9000          | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000        | 1.0000 | 1.0000 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 17            | 34     | 145    | 11              | 51     | 10     | 102    | 209    | 11     | 8      | 209    | 18     |
| Total Analysis Volume [veh/h]           | 68            | 134    | 581    | 42              | 204    | 39     | 408    | 836    | 43     | 30     | 834    | 71     |
| Presence of On-Street Parking           | No            |        | No     | No              |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0             | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 6             |        |        | 18              |        |        | 1      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0             |        |        | 0               |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 37.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Unsigna | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 4       | 3       | 0       | 8       | 4       | 8       | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lag     | -       | -       | -       | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 8       | 8       | 0       | 0       | 8       | 0       | 8        | 25      | 25      | 8        | 25      | 25      |
| Maximum Green [s]            | 30      | 30      | 0       | 0       | 30      | 0       | 40       | 53      | 53      | 40       | 53      | 53      |
| Amber [s]                    | 4.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 4.0      | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     |
| All red [s]                  | 3.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| Split [s]                    | 38      | 38      | 0       | 0       | 38      | 0       | 52       | 96      | 96      | 16       | 60      | 60      |
| Vehicle Extension [s]        | 4.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 5.0      | 6.0     | 6.0     | 3.5      | 6.0     | 6.0     |
| Walk [s]                     | 7       | 7       | 0       | 0       | 7       | 0       | 0        | 7       | 7       | 0        | 7       | 7       |
| Pedestrian Clearance [s]     | 24      | 24      | 0       | 0       | 24      | 0       | 0        | 24      | 24      | 0        | 24      | 24      |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 5.0     | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0    | 30.0    | 0.0     | 0.0     | 30.0    | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | L    | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| C, Cycle Length [s]                     | 82    | 82    | 82    | 82    | 82    | 82    | 82   | 82    | 82    |
| L, Total Lost Time per Cycle [s]        | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00 | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  | 0.00 | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 21    | 21    | 21    | 47    | 37    | 37    | 47   | 31    | 31    |
| g / C, Green / Cycle                    | 0.26  | 0.26  | 0.26  | 0.57  | 0.45  | 0.45  | 0.57 | 0.38  | 0.38  |
| (v / s)_i Volume / Saturation Flow Rate | 0.06  | 0.07  | 0.16  | 0.22  | 0.24  | 0.24  | 0.04 | 0.25  | 0.25  |
| s, saturation flow rate [veh/h]         | 1112  | 1856  | 1733  | 1854  | 1861  | 1825  | 810  | 1863  | 1811  |
| c, Capacity [veh/h]                     | 187   | 477   | 495   | 993   | 839   | 823   | 489  | 706   | 686   |
| d1, Uniform Delay [s]                   | 36.25 | 24.44 | 26.95 | 11.06 | 16.25 | 16.27 | 8.88 | 21.02 | 21.02 |
| k, delay calibration                    | 0.15  | 0.15  | 0.15  | 0.23  | 0.39  | 0.39  | 0.39 | 0.39  | 0.39  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.68  | 0.45  | 1.50  | 0.58  | 1.87  | 1.92  | 0.19 | 3.64  | 3.75  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

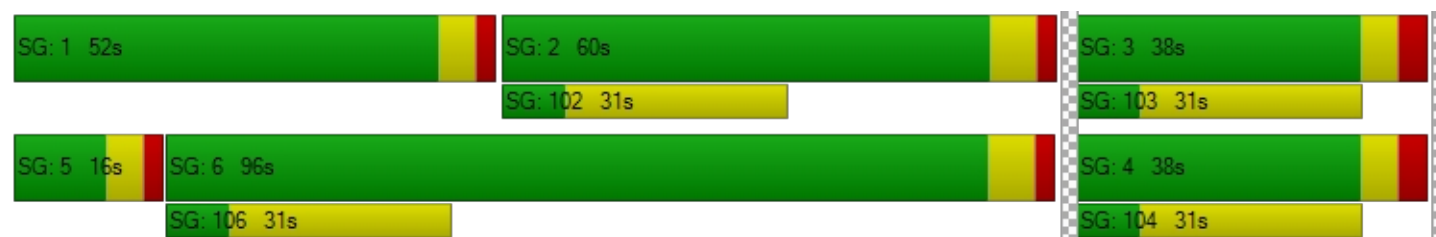
|                                       |       |       |        |       |        |        |      |        |        |
|---------------------------------------|-------|-------|--------|-------|--------|--------|------|--------|--------|
| X, volume / capacity                  | 0.36  | 0.28  | 0.58   | 0.41  | 0.53   | 0.53   | 0.06 | 0.65   | 0.65   |
| d, Delay for Lane Group [s/veh]       | 37.93 | 24.89 | 28.46  | 11.64 | 18.12  | 18.19  | 9.07 | 24.65  | 24.77  |
| Lane Group LOS                        | D     | C     | C      | B     | B      | B      | A    | C      | C      |
| Critical Lane Group                   | No    | No    | Yes    | Yes   | No     | No     | No   | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 1.38  | 2.09  | 4.97   | 1.67  | 6.04   | 5.97   | 0.21 | 7.17   | 7.00   |
| 50th-Percentile Queue Length [ft/ln]  | 34.52 | 52.20 | 124.27 | 41.79 | 151.06 | 149.18 | 5.37 | 179.23 | 174.91 |
| 95th-Percentile Queue Length [veh/ln] | 2.49  | 3.76  | 8.63   | 3.01  | 10.07  | 9.97   | 0.39 | 11.56  | 11.33  |
| 95th-Percentile Queue Length [ft/ln]  | 62.13 | 93.96 | 215.68 | 75.22 | 251.84 | 249.33 | 9.66 | 289.00 | 283.35 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 37.93 | 24.89 | 0.00 | 28.46 | 28.46 | 28.46 | 11.64 | 18.15 | 18.19 | 9.07  | 24.71 | 24.77 |
| Movement LOS                    | D     | C     |      | C     | C     | C     | B     | B     | B     | A     | C     | C     |
| d_A, Approach Delay [s/veh]     | 29.28 |       |      | 28.46 |       |       | 16.09 |       |       | 24.21 |       |       |
| Approach LOS                    | C     |       |      | C     |       |       | B     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 21.18 |       |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.564 |       |      |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 5: MD 208(Hamilton St)/38th Ave

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 38.7  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.861

#### Intersection Setup

| Name                   |                                                                                   |        |        | Hamilton St                                                                       |        |        | 38th Ave                                                                            |        |        | Hamilton St                                                                         |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Westbound                                                                         |        |        | Southwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 125.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 35.00                                                                             |        |        | 30.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Hamilton St |        |        | 38th Ave |        |        | Hamilton St |        |        |
|-----------------------------------------|--------|--------|--------|-------------|--------|--------|----------|--------|--------|-------------|--------|--------|
| Base Volume Input [veh/h]               | 167    | 61     | 23     | 46          | 355    | 11     | 23       | 118    | 269    | 96          | 335    | 158    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.27   | 3.33   | 0.00   | 3.70        | 2.00   | 0.00   | 0.00     | 2.22   | 1.89   | 1.69        | 1.88   | 1.65   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Site-Generated Trips [veh/h]            | 12     | 0      | 0      | 0           | 3      | 0      | 0        | 0      | 0      | 0           | 12     | 45     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Total Hourly Volume [veh/h]             | 179    | 61     | 23     | 46          | 358    | 11     | 23       | 118    | 269    | 96          | 347    | 203    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 50     | 17     | 6      | 13          | 99     | 3      | 6        | 33     | 75     | 27          | 96     | 56     |
| Total Analysis Volume [veh/h]           | 199    | 68     | 26     | 51          | 398    | 12     | 26       | 131    | 299    | 107         | 386    | 226    |
| Presence of On-Street Parking           | No     |        | No     | No          |        | No     | No       |        | No     | No          |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Pedestrian Volume [ped/h]               | 5      |        |        | 4           |        |        | 5        |        |        | 6           |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0           |        |        | 0        |        |        | 0           |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 90                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Semi-actuated                |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 2       | 8       | 8       | 8       | 6       | 6       | 6       | 4       | 4       | 4       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 20      | 20      | 20      | 15      | 15      | 15      | 20      | 20      | 20      |
| Maximum Green [s]            | 15       | 45      | 45      | 35      | 35      | 35      | 20      | 20      | 20      | 35      | 35      | 35      |
| Amber [s]                    | 4.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0      | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 25       | 50      | 50      | 40      | 40      | 40      | 25      | 25      | 25      | 40      | 40      | 40      |
| Vehicle Extension [s]        | 3.0      | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               | Yes      | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | Yes      | Yes     |         |         | Yes     |         |         | Yes     |         |         | Yes     |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0     | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L     | C     | C     | L     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 2.00  | 0.00  | 2.00  | 2.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 45    | 35    | 35    | 25    | 35    | 35    |
| g / C, Green / Cycle                    | 0.50  | 0.39  | 0.39  | 0.28  | 0.39  | 0.39  |
| (v / s)_i Volume / Saturation Flow Rate | 0.31  | 0.06  | 0.22  | 0.28  | 0.11  | 0.35  |
| s, saturation flow rate [veh/h]         | 959   | 793   | 1853  | 1639  | 973   | 1746  |
| c, Capacity [veh/h]                     | 585   | 111   | 721   | 495   | 268   | 679   |
| d1, Uniform Delay [s]                   | 13.51 | 43.90 | 21.58 | 32.61 | 32.92 | 25.87 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 3.04  | 12.96 | 3.24  | 25.06 | 4.40  | 17.38 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |       |        |        |        |        |
|---------------------------------------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.50   | 0.46  | 0.57   | 0.92   | 0.40   | 0.90   |
| d, Delay for Lane Group [s/veh]       | 16.55  | 56.86 | 24.83  | 57.67  | 37.32  | 43.25  |
| Lane Group LOS                        | B      | E     | C      | E      | D      | D      |
| Critical Lane Group                   | Yes    | No    | No     | Yes    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 3.88   | 1.52  | 7.06   | 13.03  | 2.38   | 14.74  |
| 50th-Percentile Queue Length [ft/ln]  | 96.94  | 37.93 | 176.39 | 325.84 | 59.46  | 368.54 |
| 95th-Percentile Queue Length [veh/ln] | 6.98   | 2.73  | 11.41  | 18.95  | 4.28   | 21.04  |
| 95th-Percentile Queue Length [ft/ln]  | 174.49 | 68.28 | 285.29 | 473.86 | 107.03 | 525.96 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 16.55 | 16.55 | 16.55 | 56.86 | 24.83 | 24.83 | 57.67 | 57.67 | 57.67 | 37.32 | 43.25 | 43.25 |
| Movement LOS                    | B     | B     | B     | E     | C     | C     | E     | E     | E     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 16.55 |       |       | 28.37 |       |       | 57.67 |       |       | 42.37 |       |       |
| Approach LOS                    | B     |       |       | C     |       |       | E     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 38.72 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.861 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 6: US 1/MD 410

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 98.9  
 Level Of Service: F  
 Volume to Capacity (v/c): 0.960

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 2                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 200.00                                                                            | 100.00 | 100.00 | 225.00                                                                            | 100.00 | 100.00 | 600.00                                                                              | 100.00 | 100.00 | 700.00                                                                              | 100.00 | 450.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 45.00                                                                             |        |        | 50.00                                                                               |        |        | 40.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 426    | 527    | 53     | 168    | 704    | 122    | 183    | 1009   | 252    | 292    | 1751   | 147    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.15   | 2.00   | 2.38   | 2.07   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.03   | 1.67   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 8      | 0      | 0      | 0      | 0      | 8      | 30     | 58     | 31     | 0      | 15     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 434    | 527    | 53     | 168    | 704    | 130    | 213    | 1067   | 283    | 292    | 1766   | 147    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 121    | 146    | 15     | 47     | 196    | 36     | 59     | 296    | 79     | 81     | 491    | 41     |
| Total Analysis Volume [veh/h]           | 482    | 586    | 59     | 187    | 782    | 144    | 237    | 1186   | 314    | 324    | 1962   | 163    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 3      |        |        | 6      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 180                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 1        | 6       | 6       | 5        | 2       | 0       | 7        | 4       | 4       | 3        | 8       | 8       |
| Auxiliary Signal Groups      |          |         |         |          |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 5        | 25      | 0       | 5        | 15      | 15      | 5        | 25      | 25      |
| Maximum Green [s]            | 25       | 42      | 42      | 25       | 42      | 0       | 25       | 66      | 66      | 25       | 66      | 66      |
| Amber [s]                    | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 0.0     | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 0.0     | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 2.0     |
| Split [s]                    | 30       | 48      | 48      | 30       | 48      | 0       | 30       | 72      | 72      | 30       | 72      | 72      |
| Vehicle Extension [s]        | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 0.0     | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Walk [s]                     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 4.5     | 4.5     | 3.0      | 4.5     | 0.0     | 3.0      | 4.5     | 4.5     | 3.0      | 4.5     | 4.5     |
| Minimum Recall               | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               | No       | Yes     |         | No       | Yes     |         | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 294.0   | 294.0   |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 5.0     | 5.0     | 30.0     | 6.0     | 6.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | L     | C     | R     | L      | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| C, Cycle Length [s]                     | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180    | 180   | 180   |
| L, Total Lost Time per Cycle [s]        | 6.50  | 6.50  | 6.50  | 6.50  | 6.50  | 6.50  | 5.00  | 6.50  | 6.50  | 5.00   | 6.50  | 6.50  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 4.50  | 4.50  | 0.00  | 4.50  | 4.50  | 3.00  | 4.50  | 4.50  | 3.00   | 4.50  | 4.50  |
| g_i, Effective Green Time [s]           | 72    | 51    | 51    | 72    | 44    | 44    | 25    | 66    | 66    | 25     | 66    | 66    |
| g / C, Green / Cycle                    | 0.40  | 0.28  | 0.28  | 0.40  | 0.25  | 0.25  | 0.14  | 0.36  | 0.36  | 0.14   | 0.36  | 0.36  |
| (v / s)_i Volume / Saturation Flow Rate | 0.25  | 0.18  | 0.18  | 0.18  | 0.26  | 0.26  | 0.13  | 0.33  | 0.20  | 0.18   | 0.40  | 0.40  |
| s, saturation flow rate [veh/h]         | 1963  | 1863  | 1801  | 1040  | 1863  | 1761  | 1774  | 3547  | 1583  | 1774   | 3546  | 1791  |
| c, Capacity [veh/h]                     | 570   | 526   | 509   | 350   | 460   | 435   | 246   | 1291  | 576   | 246    | 1290  | 652   |
| d1, Uniform Delay [s]                   | 52.22 | 56.21 | 56.23 | 39.47 | 67.77 | 67.77 | 77.04 | 54.72 | 45.43 | 77.51  | 57.25 | 57.25 |
| k, delay calibration                    | 0.33  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.39  | 0.50  | 0.50  | 0.50   | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 10.11 | 5.46  | 5.67  | 5.73  | 50.77 | 52.68 | 41.80 | 11.92 | 3.68  | 167.58 | 52.48 | 68.37 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |

**Lane Group Results**

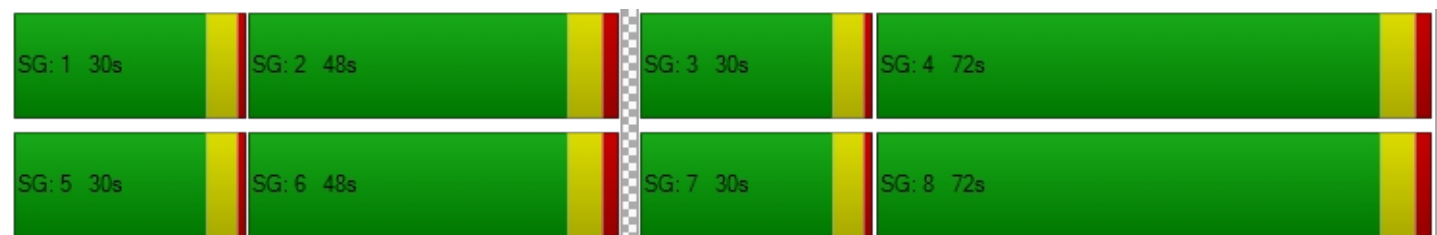
|                                       |        |        |        |        |        |        |        |        |        |        |         |         |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| X, volume / capacity                  | 0.85   | 0.62   | 0.62   | 0.53   | 1.03   | 1.04   | 0.96   | 0.92   | 0.54   | 1.32   | 1.09    | 1.11    |
| d, Delay for Lane Group [s/veh]       | 62.33  | 61.66  | 61.90  | 45.20  | 118.54 | 120.45 | 118.84 | 66.63  | 49.10  | 245.09 | 109.73  | 125.63  |
| Lane Group LOS                        | E      | E      | E      | D      | F      | F      | F      | E      | D      | F      | F       | F       |
| Critical Lane Group                   | Yes    | No     | No     | No     | No     | Yes    | Yes    | No     | No     | No     | No      | Yes     |
| 50th-Percentile Queue Length [veh/ln] | 8.25   | 13.63  | 13.24  | 6.11   | 27.33  | 26.06  | 13.60  | 27.09  | 11.56  | 22.83  | 38.28   | 41.54   |
| 50th-Percentile Queue Length [ft/ln]  | 206.22 | 340.77 | 331.06 | 152.83 | 683.17 | 651.61 | 340.03 | 677.36 | 289.02 | 570.83 | 956.94  | 1038.60 |
| 95th-Percentile Queue Length [veh/ln] | 12.96  | 19.69  | 19.21  | 10.17  | 36.65  | 35.20  | 19.65  | 35.63  | 17.14  | 34.43  | 51.40   | 56.00   |
| 95th-Percentile Queue Length [ft/ln]  | 323.98 | 492.14 | 480.26 | 254.20 | 916.19 | 880.06 | 491.24 | 890.77 | 428.42 | 860.73 | 1285.12 | 1399.88 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |        |        |        |        |       |       |        |        |        |
|---------------------------------|-------|-------|-------|--------|--------|--------|--------|-------|-------|--------|--------|--------|
| d_M, Delay for Movement [s/veh] | 62.33 | 61.77 | 61.90 | 45.20  | 119.29 | 120.45 | 118.84 | 66.63 | 49.10 | 245.09 | 114.26 | 125.63 |
| Movement LOS                    | E     | E     | E     | D      | F      | F      | F      | E     | D     | F      | F      | F      |
| d_A, Approach Delay [s/veh]     | 62.02 |       |       | 106.99 |        |        | 70.59  |       |       | 132.32 |        |        |
| Approach LOS                    | E     |       |       | F      |        |        | E      |       |       | F      |        |        |
| d_I, Intersection Delay [s/veh] | 98.92 |       |       |        |        |        |        |       |       |        |        |        |
| Intersection LOS                | F     |       |       |        |        |        |        |       |       |        |        |        |
| Intersection V/C                | 0.960 |       |       |        |        |        |        |       |       |        |        |        |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 7: US 1/Queensbury Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 17.8  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.542

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Queensbury                                                                          |        |        | Queensbury                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 250.00                                                                            | 100.00 | 100.00 | 150.00                                                                            | 100.00 | 100.00 | 350.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 200.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 45.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | No                                                                                |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Queensbury |        |        | Queensbury |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 66     | 781    | 117    | 46     | 1010   | 34     | 67         | 115    | 76     | 137        | 123    | 168    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 1.89   | 3.85   | 2.00   | 3.85   | 1.96       | 2.30   | 1.85   | 1.69       | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 8      | 0      | 0      | 31     | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 66     | 789    | 117    | 46     | 1041   | 34     | 67         | 115    | 76     | 137        | 123    | 168    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 18     | 219    | 33     | 13     | 289    | 9      | 19         | 32     | 21     | 38         | 34     | 47     |
| Total Analysis Volume [veh/h]           | 73     | 877    | 130    | 51     | 1157   | 38     | 74         | 128    | 84     | 152        | 137    | 187    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No         |        | No     | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 11     |        |        | 11         |        |        | 4          |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0          |        |        | 0          |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 6.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 2       | 6       | 6       | 6       | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 15      | 15      | 15      | 8       | 8       | 8       | 8       | 8       | 8       |
| Maximum Green [s]            | 8        | 60      | 60      | 46      | 46      | 46      | 20      | 20      | 20      | 20      | 20      | 20      |
| Amber [s]                    | 3.5      | 4.5     | 4.5     | 4.5     | 4.5     | 4.5     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0      | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 13       | 65      | 65      | 52      | 52      | 52      | 25      | 25      | 25      | 25      | 25      | 25      |
| Vehicle Extension [s]        | 3.0      | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 2.5      | 3.5     | 3.5     | 3.5     | 3.5     | 3.5     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | No       | Yes     |         |         | Yes     |         |         | No      |         |         | No      |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 294.0   | 294.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0     | 6.0     | 6.0     | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | L     | C     | C     | L     | C     | L     | C     | R     |
|-----------------------------------------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90   | 90   | 90   | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.50 | 5.50 | 5.50 | 5.50  | 5.50  | 5.50  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00 | 3.50 | 3.50 | 3.50  | 3.50  | 3.50  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 60   | 60   | 60   | 51    | 51    | 51    | 20    | 20    | 20    | 20    | 20    |
| g / C, Green / Cycle                    | 0.66 | 0.66 | 0.66 | 0.56  | 0.56  | 0.56  | 0.22  | 0.22  | 0.22  | 0.22  | 0.22  |
| (v / s)_i Volume / Saturation Flow Rate | 0.12 | 0.28 | 0.28 | 0.09  | 0.32  | 0.32  | 0.06  | 0.12  | 0.13  | 0.07  | 0.12  |
| s, saturation flow rate [veh/h]         | 616  | 1863 | 1778 | 547   | 1863  | 1841  | 1238  | 1736  | 1168  | 1863  | 1560  |
| c, Capacity [veh/h]                     | 427  | 1232 | 1176 | 303   | 1049  | 1037  | 251   | 386   | 188   | 414   | 347   |
| d1, Uniform Delay [s]                   | 7.85 | 7.14 | 7.14 | 17.37 | 12.67 | 12.68 | 35.55 | 31.02 | 42.05 | 29.39 | 30.94 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.12  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.87 | 1.05 | 1.10 | 1.19  | 2.27  | 2.31  | 0.65  | 1.22  | 8.47  | 0.46  | 1.31  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |        |       |        |        |        |        |
|---------------------------------------|-------|--------|--------|-------|--------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.17  | 0.42   | 0.42   | 0.17  | 0.57   | 0.57   | 0.29  | 0.55   | 0.81   | 0.33   | 0.54   |
| d, Delay for Lane Group [s/veh]       | 8.72  | 8.19   | 8.24   | 18.56 | 14.94  | 14.99  | 36.20 | 32.24  | 50.52  | 29.86  | 32.25  |
| Lane Group LOS                        | A     | A      | A      | B     | B      | B      | D     | C      | D      | C      | C      |
| Critical Lane Group                   | Yes   | No     | No     | No    | No     | Yes    | No    | No     | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 0.48  | 3.85   | 3.70   | 0.73  | 7.17   | 7.11   | 1.51  | 4.13   | 3.80   | 2.50   | 3.64   |
| 50th-Percentile Queue Length [ft/ln]  | 11.91 | 96.22  | 92.45  | 18.28 | 179.16 | 177.67 | 37.85 | 103.27 | 95.11  | 62.56  | 91.12  |
| 95th-Percentile Queue Length [veh/ln] | 0.86  | 6.93   | 6.66   | 1.32  | 11.56  | 11.48  | 2.72  | 7.44   | 6.85   | 4.50   | 6.56   |
| 95th-Percentile Queue Length [ft/ln]  | 21.45 | 173.20 | 166.41 | 32.90 | 288.92 | 286.97 | 68.12 | 185.88 | 171.20 | 112.61 | 164.02 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 8.72  | 8.21 | 8.24 | 18.56 | 14.96 | 14.99 | 36.20 | 32.24 | 32.24 | 50.52 | 29.86 | 32.25 |
| Movement LOS                    | A     | A    | A    | B     | B     | B     | D     | C     | C     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 8.25  |      |      | 15.11 |       |       | 33.27 |       |       | 37.39 |       |       |
| Approach LOS                    | A     |      |      | B     |       |       | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 17.83 |      |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.542 |      |      |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 8: US 1/Oglethorpe Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 12.0  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.535

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Oglethorpe                                                                          |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 35.00                                                                             |        | 40.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | No                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Oglethorpe |        |
|-----------------------------------------|--------|--------|--------|--------|------------|--------|
| Base Volume Input [veh/h]               | 21     | 973    | 1208   | 40     | 117        | 54     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.04   | 1.97   | 0.00   | 1.67       | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0          | 0      |
| Site-Generated Trips [veh/h]            | 0      | 8      | 31     | 0      | 0          | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0          | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0          | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0          | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0          | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0          | 0      |
| Total Hourly Volume [veh/h]             | 21     | 981    | 1239   | 40     | 117        | 54     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 6      | 273    | 344    | 11     | 33         | 15     |
| Total Analysis Volume [veh/h]           | 23     | 1090   | 1377   | 44     | 130        | 60     |
| Presence of On-Street Parking           | No     | No     | No     | No     | No         | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0          | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0          | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0          |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0          |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 66.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 2          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |       |       |
| Lead / Lag                   | Lag        | -          | -          | -          | Lag   | -     |
| Minimum Green [s]            | 15         | 15         | 15         | 15         | 15    | 15    |
| Maximum Green [s]            | 85         | 85         | 85         | 85         | 25    | 25    |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 90         | 90         | 90         | 90         | 30    | 30    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 0          | 0          | 0          | 0          | 7     | 7     |
| Pedestrian Clearance [s]     | 0          | 0          | 0          | 0          | 10    | 10    |
| Rest In Walk                 |            | No         | No         |            | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Minimum Recall               |            | No         | No         |            | No    |       |
| Maximum Recall               |            | Yes        | Yes        |            | Yes   |       |
| Pedestrian Recall            |            | No         | No         |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C    | C    | C     |
|-----------------------------------------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00 | 3.00 | 3.00 | 3.00 | 3.00  |
| g_i, Effective Green Time [s]           | 85   | 85   | 85   | 85   | 25    |
| g / C, Green / Cycle                    | 0.71 | 0.71 | 0.71 | 0.71 | 0.21  |
| (v / s)_i Volume / Saturation Flow Rate | 0.33 | 0.33 | 0.38 | 0.39 | 0.11  |
| s, saturation flow rate [veh/h]         | 1721 | 1694 | 1863 | 1843 | 1743  |
| c, Capacity [veh/h]                     | 1250 | 1200 | 1320 | 1306 | 363   |
| d1, Uniform Delay [s]                   | 7.31 | 7.57 | 8.25 | 8.31 | 42.20 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.50  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 1.17 | 1.27 | 1.58 | 1.63 | 5.31  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.45   | 0.46   | 0.54   | 0.54   | 0.52   |
| d, Delay for Lane Group [s/veh]       | 8.47   | 8.84   | 9.83   | 9.94   | 47.51  |
| Lane Group LOS                        | A      | A      | A      | A      | D      |
| Critical Lane Group                   | No     | No     | No     | Yes    | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 5.72   | 5.83   | 7.91   | 7.97   | 5.60   |
| 50th-Percentile Queue Length [ft/ln]  | 142.93 | 145.81 | 197.77 | 199.35 | 139.89 |
| 95th-Percentile Queue Length [veh/ln] | 9.64   | 9.79   | 12.52  | 12.61  | 9.48   |
| 95th-Percentile Queue Length [ft/ln]  | 240.97 | 244.82 | 313.08 | 315.13 | 236.88 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |       |       |
|---------------------------------|-------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 8.47  | 8.66 | 9.88 | 9.94 | 47.51 | 47.51 |
| Movement LOS                    | A     | A    | A    | A    | D     | D     |
| d_A, Approach Delay [s/veh]     | 8.65  |      | 9.88 |      | 47.51 |       |
| Approach LOS                    | A     |      | A    |      | D     |       |
| d_I, Intersection Delay [s/veh] | 12.01 |      |      |      |       |       |
| Intersection LOS                | B     |      |      |      |       |       |
| Intersection V/C                | 0.535 |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 9: US 1/Madison St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 16.9  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.649

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Madison                                                                             |        |        | Madison                                                                             |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Madison |        |        | Madison |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|---------|--------|--------|---------|--------|--------|
| Base Volume Input [veh/h]               | 72     | 925    | 12     | 7      | 1159   | 91     | 109     | 20     | 114    | 68      | 61     | 22     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.00   | 0.00   | 0.00   | 2.00   | 0.00   | 0.00    | 0.00   | 0.00   | 0.00    | 0.00   | 1.61   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00    | 1.00   | 1.00   | 1.00    | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 8      | 0      | 0      | 31     | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Total Hourly Volume [veh/h]             | 72     | 933    | 12     | 7      | 1190   | 91     | 109     | 20     | 114    | 68      | 61     | 22     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000  | 0.9000 | 0.9000 | 0.9000  | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 20     | 259    | 3      | 2      | 331    | 25     | 30      | 6      | 32     | 19      | 17     | 6      |
| Total Analysis Volume [veh/h]           | 80     | 1037   | 13     | 8      | 1322   | 101    | 121     | 22     | 127    | 76      | 68     | 24     |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No      |        | No     | No      |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 2       |        |        | 0       |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0       |        |        | 0       |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 74.0                            |
| Offset Reference          | LagEnd                          |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 2       | 2       | 2       | 6       | 6       | 6       | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 20      | 20      | 20      | 20      | 15      | 15      | 15      | 15      | 15      | 15      |
| Maximum Green [s]            | 85      | 85      | 85      | 85      | 85      | 85      | 25      | 25      | 25      | 25      | 25      | 25      |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 90      | 90      | 90      | 90      | 90      | 90      | 30      | 30      | 30      | 30      | 30      | 30      |
| Vehicle Extension [s]        | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 7       | 7       | 7       | 7       | 7       | 7       | 7       | 7       | 7       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 13      | 13      | 13      | 13      | 13      | 13      | 10      | 10      | 10      | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               |         | Yes     |         |         | Yes     |         |         | Yes     |         |         | Yes     |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | C    | L     | C    | C    | C     | C     |
|-----------------------------------------|-------|------|------|-------|------|------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120  | 120  | 120   | 120  | 120  | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00 | 5.00 | 5.00  | 5.00 | 5.00 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 2.00  | 0.00 | 0.00 | 2.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00 | 3.00 | 3.00  | 3.00 | 3.00 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 85    | 85   | 85   | 85    | 85   | 85   | 25    | 25    |
| g / C, Green / Cycle                    | 0.71  | 0.71 | 0.71 | 0.71  | 0.71 | 0.71 | 0.21  | 0.21  |
| (v / s)_i Volume / Saturation Flow Rate | 0.21  | 0.28 | 0.28 | 0.01  | 0.39 | 0.39 | 0.20  | 0.13  |
| s, saturation flow rate [veh/h]         | 383   | 1863 | 1855 | 546   | 1863 | 1816 | 1375  | 1312  |
| c, Capacity [veh/h]                     | 255   | 1319 | 1314 | 375   | 1319 | 1287 | 330   | 317   |
| d1, Uniform Delay [s]                   | 18.20 | 7.11 | 7.11 | 10.87 | 8.31 | 8.34 | 47.14 | 42.60 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50 | 0.50 | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 3.19  | 0.90 | 0.91 | 0.10  | 1.62 | 1.68 | 19.82 | 6.23  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |        |        |        |
|---------------------------------------|-------|--------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.31  | 0.40   | 0.40   | 0.02  | 0.54   | 0.55   | 0.82   | 0.53   |
| d, Delay for Lane Group [s/veh]       | 21.39 | 8.01   | 8.02   | 10.98 | 9.93   | 10.02  | 66.96  | 48.82  |
| Lane Group LOS                        | C     | A      | A      | B     | A      | B      | E      | D      |
| Critical Lane Group                   | No    | No     | No     | No    | No     | Yes    | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 1.56  | 5.18   | 5.16   | 0.10  | 8.33   | 8.21   | 9.82   | 5.10   |
| 50th-Percentile Queue Length [ft/ln]  | 39.07 | 129.45 | 128.94 | 2.50  | 208.13 | 205.26 | 245.44 | 127.56 |
| 95th-Percentile Queue Length [veh/ln] | 2.81  | 8.91   | 8.88   | 0.18  | 13.06  | 12.91  | 14.96  | 8.81   |
| 95th-Percentile Queue Length [ft/ln]  | 70.33 | 222.75 | 222.06 | 4.50  | 326.43 | 322.74 | 373.90 | 220.18 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |      |       |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 21.39 | 8.02 | 8.02 | 10.98 | 9.97 | 10.02 | 66.96 | 66.96 | 66.96 | 48.82 | 48.82 | 48.82 |
| Movement LOS                    | C     | A    | A    | B     | A    | B     | E     | E     | E     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 8.96  |      |      | 9.98  |      |       | 66.96 |       |       | 48.82 |       |       |
| Approach LOS                    | A     |      |      | A     |      |       | E     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 16.90 |      |      |       |      |       |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |      |       |       |       |       |       |       |       |
| Intersection V/C                | 0.649 |      |      |       |      |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 90s

SG: 4 30s

SG: 102 20s

SG: 104 17s

SG: 6 90s

SG: 8 30s

SG: 106 20s

### Intersection Level Of Service Report

#### Intersection 10: US 1/Jefferson St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 20.4  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.778

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Jefferson St                                                                        |        |        |                                                                                     |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00 | 175.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | No                                                                                |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Jefferson St |        |        |        |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 301    | 950    | 1      | 7      | 1257   | 103    | 57           | 7      | 105    | 40     | 24     | 8      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.82   | 2.00   | 2.00   | 2.00   | 2.00   | 2.22   | 1.43         | 2.00   | 1.82   | 2.00   | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 8      | 0      | 0      | 31     | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 301    | 958    | 1      | 7      | 1288   | 103    | 57           | 7      | 105    | 40     | 24     | 8      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 0.9000       | 1.0000 | 0.9000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 84     | 266    | 0      | 2      | 358    | 29     | 16           | 2      | 29     | 10     | 6      | 2      |
| Total Analysis Volume [veh/h]           | 334    | 1064   | 1      | 7      | 1431   | 114    | 63           | 7      | 117    | 40     | 24     | 8      |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No           |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 0            |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0            |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 90.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 0       | 0       | 6       | 6       | 4       | 4       | 4       | 0       | 4       | 0       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | -       | -       | -       | Lag     | -       | -       | -       | -       | -       |
| Minimum Green [s]            | 8        | 20      | 0       | 0       | 20      | 20      | 20      | 20      | 20      | 0       | 20      | 0       |
| Maximum Green [s]            | 15       | 90      | 0       | 0       | 70      | 70      | 20      | 20      | 20      | 0       | 20      | 0       |
| Amber [s]                    | 4.0      | 4.0     | 0.0     | 0.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                  | 1.0      | 1.0     | 0.0     | 0.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 20       | 95      | 0       | 0       | 75      | 75      | 25      | 25      | 25      | 0       | 25      | 0       |
| Vehicle Extension [s]        | 3.0      | 3.0     | 0.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 7       | 7       | 7       | 7       | 7       | 0       | 7       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 13      | 13      | 13      | 13      | 13      | 0       | 13      | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 3.0     | 0.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 0.0     | 3.0     | 0.0     |
| Minimum Recall               | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | Yes      | Yes     |         |         | Yes     |         |         | No      |         |         | No      |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C    | C    | L     | C     | C     | C     | C     |
|-----------------------------------------|-------|------|------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120  | 120  | 120   | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 3.00 | 3.00 | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 90    | 90   | 90   | 70    | 70    | 70    | 20    | 20    |
| g / C, Green / Cycle                    | 0.75  | 0.75 | 0.75 | 0.58  | 0.58  | 0.58  | 0.17  | 0.17  |
| (v / s)_i Volume / Saturation Flow Rate | 0.54  | 0.29 | 0.29 | 0.01  | 0.42  | 0.42  | 0.12  | 0.06  |
| s, saturation flow rate [veh/h]         | 623   | 1863 | 1862 | 528   | 1863  | 1815  | 1553  | 1150  |
| c, Capacity [veh/h]                     | 457   | 1397 | 1397 | 306   | 1087  | 1059  | 299   | 238   |
| d1, Uniform Delay [s]                   | 25.38 | 5.25 | 5.25 | 17.30 | 17.90 | 18.02 | 47.16 | 44.03 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  | 0.21  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 9.91  | 0.79 | 0.79 | 0.14  | 4.06  | 4.30  | 4.09  | 0.71  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |       |        |        |        |       |
|---------------------------------------|--------|--------|--------|-------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.73   | 0.38   | 0.38   | 0.02  | 0.72   | 0.72   | 0.63   | 0.30  |
| d, Delay for Lane Group [s/veh]       | 35.29  | 6.04   | 6.04   | 17.44 | 21.97  | 22.32  | 51.25  | 44.73 |
| Lane Group LOS                        | D      | A      | A      | B     | C      | C      | D      | D     |
| Critical Lane Group                   | Yes    | No     | No     | No    | No     | No     | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.40   | 4.20   | 4.20   | 0.12  | 15.66  | 15.55  | 5.67   | 1.95  |
| 50th-Percentile Queue Length [ft/ln]  | 85.12  | 105.04 | 105.02 | 2.89  | 391.43 | 388.69 | 141.70 | 48.87 |
| 95th-Percentile Queue Length [veh/ln] | 6.13   | 7.56   | 7.56   | 0.21  | 22.15  | 22.01  | 9.57   | 3.52  |
| 95th-Percentile Queue Length [ft/ln]  | 153.22 | 189.07 | 189.03 | 5.21  | 553.66 | 550.36 | 239.31 | 87.97 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 35.29 | 6.04 | 6.04 | 17.44 | 22.13 | 22.32 | 51.25 | 51.25 | 51.25 | 44.73 | 44.73 | 44.73 |
| Movement LOS                    | D     | A    | A    | B     | C     | C     | D     | D     | D     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 13.03 |      |      | 22.12 |       |       | 51.25 |       |       | 44.73 |       |       |
| Approach LOS                    | B     |      |      | C     |       |       | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 20.36 |      |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |      |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.778 |      |      |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 95s

SG: 4 25s

SG: 104 20s

SG: 5 20s

SG: 6 75s

SG: 106 20s

### Intersection Level Of Service Report

#### Intersection 11: US 1/Hamilton St (North)

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 1.6   |
| Analysis Method: | HCM 2010   | Level Of Service:         | A     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.475 |

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Hamilton                                                                            |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Westbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Thru   | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 150.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 35.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Hamilton |        |
|-----------------------------------------|--------|--------|--------|--------|----------|--------|
| Base Volume Input [veh/h]               | 1228   | 4      | 2      | 1370   | 0        | 1      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 3.85   | 0.00   | 2.04   | 0.00     | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 8      | 0      | 0      | 31     | 0        | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0        | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 1236   | 4      | 2      | 1401   | 0        | 1      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 343    | 1      | 1      | 389    | 0        | 0      |
| Total Analysis Volume [veh/h]           | 1373   | 4      | 2      | 1557   | 0        | 1      |
| Presence of On-Street Parking           | No     | No     | No     | No     | No       | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0        | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0        | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0        |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 90.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 2          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |       |       |
| Lead / Lag                   | -          | -          | Lag        | -          | Lag   | -     |
| Minimum Green [s]            | 20         | 20         | 20         | 20         | 15    | 15    |
| Maximum Green [s]            | 84         | 84         | 84         | 84         | 25    | 25    |
| Amber [s]                    | 5.0        | 5.0        | 5.0        | 5.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 90         | 90         | 90         | 90         | 30    | 30    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 7          | 7          | 0          | 0          | 5     | 5     |
| Pedestrian Clearance [s]     | 8          | 8          | 0          | 0          | 10    | 10    |
| Rest In Walk                 | No         |            |            | No         | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 4.0        | 4.0        | 4.0        | 4.0        | 3.0   | 3.0   |
| Minimum Recall               | No         |            |            | No         | No    |       |
| Maximum Recall               | Yes        |            |            | Yes        | No    |       |
| Pedestrian Recall            | No         |            |            | No         | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | L    | C    | C     |
|-----------------------------------------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 6.00 | 6.00 | 6.00 | 6.00 | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 2.00 | 0.00 | 0.00  |
| l2, Clearance Lost Time [s]             | 4.00 | 4.00 | 4.00 | 4.00 | 3.00  |
| g_i, Effective Green Time [s]           | 108  | 108  | 108  | 108  | 1     |
| g / C, Green / Cycle                    | 0.90 | 0.90 | 0.90 | 0.90 | 0.00  |
| (v / s)_i Volume / Saturation Flow Rate | 0.37 | 0.37 | 0.01 | 0.44 | 0.00  |
| s, saturation flow rate [veh/h]         | 1863 | 1861 | 400  | 3545 | 1615  |
| c, Capacity [veh/h]                     | 1681 | 1680 | 387  | 3200 | 9     |
| d1, Uniform Delay [s]                   | 0.90 | 0.90 | 2.03 | 1.01 | 59.36 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 0.74 | 0.74 | 0.02 | 0.53 | 5.10  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |       |      |       |       |
|---------------------------------------|-------|-------|------|-------|-------|
| X, volume / capacity                  | 0.41  | 0.41  | 0.01 | 0.49  | 0.11  |
| d, Delay for Lane Group [s/veh]       | 1.64  | 1.65  | 2.05 | 1.55  | 64.45 |
| Lane Group LOS                        | A     | A     | A    | A     | E     |
| Critical Lane Group                   | No    | No    | No   | Yes   | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 0.71  | 0.71  | 0.01 | 0.39  | 0.04  |
| 50th-Percentile Queue Length [ft/ln]  | 17.78 | 17.80 | 0.21 | 9.66  | 1.09  |
| 95th-Percentile Queue Length [veh/ln] | 1.28  | 1.28  | 0.02 | 0.70  | 0.08  |
| 95th-Percentile Queue Length [ft/ln]  | 32.00 | 32.04 | 0.39 | 17.38 | 1.96  |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |       |       |
|---------------------------------|-------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 1.64  | 1.65 | 2.05 | 1.55 | 64.45 | 64.45 |
| Movement LOS                    | A     | A    | A    | A    | E     | E     |
| d_A, Approach Delay [s/veh]     | 1.64  |      | 1.55 |      | 64.45 |       |
| Approach LOS                    | A     |      | A    |      | E     |       |
| d_I, Intersection Delay [s/veh] | 1.61  |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |       |       |
| Intersection V/C                | 0.475 |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 12: US 1/Hamilton St (South)/US 1 Alt

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 312.1 |
| Analysis Method: | HCM 2010   | Level Of Service:         | F     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.941 |

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Hamilton                                                                            |        |        | US 1 ALT                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Northwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 250.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Hamilton |        |        | US 1 ALT |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]               | 0      | 328    | 20     | 466    | 901    | 0      | 7        | 7      | 10     | 95       | 0      | 902    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.17   | 0.00   | 2.00   | 2.06   | 0.00   | 0.00     | 0.00   | 0.00   | 2.63     | 0.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 3      | 0      | 18     | 13     | 0      | 0        | 0      | 0      | 0        | 0      | 5      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0      | 331    | 20     | 484    | 914    | 0      | 7        | 7      | 10     | 95       | 0      | 907    |
| Peak Hour Factor                        | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 | 0.9000   | 0.9000 | 0.9000 | 0.9000   | 1.0000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0      | 92     | 6      | 134    | 254    | 0      | 2        | 2      | 3      | 26       | 0      | 252    |
| Total Analysis Volume [veh/h]           | 0      | 368    | 22     | 538    | 1016   | 0      | 8        | 8      | 11     | 106      | 0      | 1008   |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 3        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Semi-actuated                   |
| Offset [s]                | 18.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Split | Split | Split | Permiss | Permiss | Overlap |
|------------------------------|---------|---------|---------|----------|---------|---------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 0       | 6       | 6       | 5        | 2       | 0       | 3     | 3     | 3     | 8       | 0       | 8       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |       |       |       |         |         | 5,8     |
| Lead / Lag                   | -       | -       | -       | Lead     | -       | -       | Lag   | -     | -     | Lag     | -       | -       |
| Minimum Green [s]            | 0       | 20      | 20      | 4        | 20      | 0       | 5     | 5     | 5     | 5       | 0       | 5       |
| Maximum Green [s]            | 0       | 55      | 55      | 20       | 63      | 0       | 5     | 5     | 5     | 30      | 0       | 30      |
| Amber [s]                    | 0.0     | 4.0     | 4.0     | 4.0      | 4.0     | 0.0     | 3.5   | 3.5   | 3.5   | 3.0     | 0.0     | 3.0     |
| All red [s]                  | 0.0     | 1.0     | 1.0     | 0.0      | 1.0     | 0.0     | 1.5   | 1.5   | 1.5   | 1.0     | 0.0     | 1.0     |
| Split [s]                    | 0       | 60      | 60      | 8        | 68      | 0       | 10    | 10    | 10    | 42      | 0       | 42      |
| Vehicle Extension [s]        | 0.0     | 3.0     | 3.0     | 3.0      | 3.0     | 0.0     | 3.0   | 3.0   | 3.0   | 3.0     | 0.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0        | 0       | 0       | 0     | 0     | 0     | 5       | 0       | 5       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0        | 0       | 0       | 0     | 0     | 0     | 10      | 0       | 10      |
| Rest In Walk                 |         | No      |         |          | No      |         |       | No    |       | No      |         |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 2.0     | 2.0      | 2.0     | 0.0     | 2.0   | 2.0   | 2.0   | 2.0     | 0.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 3.0     | 2.0      | 3.0     | 0.0     | 3.0   | 3.0   | 3.0   | 2.0     | 0.0     | 2.0     |
| Minimum Recall               |         | No      |         | Yes      | No      |         |       | No    |       | No      |         | No      |
| Maximum Recall               |         | Yes     |         | No       | Yes     |         |       | No    |       | No      |         | No      |
| Pedestrian Recall            |         | No      |         | No       | No      |         |       | No    |       | No      |         | No      |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 50.0    | 50.0    | 50.0     | 50.0    | 0.0     | 50.0  | 50.0  | 50.0  | 50.0    | 0.0     | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C     | C     | C     | L     | R      |
|-----------------------------------------|------|------|-------|-------|-------|-------|--------|
| C, Cycle Length [s]                     | 120  | 120  | 120   | 120   | 120   | 120   | 120    |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 4.00  | 4.00   |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   |
| l2, Clearance Lost Time [s]             | 3.00 | 3.00 | 0.00  | 3.00  | 3.00  | 2.00  | 0.00   |
| g_i, Effective Green Time [s]           | 78   | 78   | 86    | 86    | 3     | 17    | 25     |
| g / C, Green / Cycle                    | 0.65 | 0.65 | 0.71  | 0.71  | 0.02  | 0.14  | 0.21   |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.11 | 0.73  | 0.59  | 0.02  | 0.06  | 0.60   |
| s, saturation flow rate [veh/h]         | 1860 | 1823 | 1051  | 1337  | 1748  | 1763  | 1667   |
| c, Capacity [veh/h]                     | 1204 | 1180 | 780   | 955   | 43    | 255   | 352    |
| d1, Uniform Delay [s]                   | 8.34 | 8.36 | 19.14 | 12.00 | 57.96 | 46.72 | 47.33  |
| k, delay calibration                    | 0.50 | 0.50 | 0.50  | 0.50  | 0.11  | 0.11  | 0.50   |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   |
| d2, Incremental Delay [s]               | 0.29 | 0.30 | 27.57 | 8.19  | 13.71 | 1.08  | 846.26 |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   |
| PF, progression factor                  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   |

**Lane Group Results**

|                                       |       |       |        |        |       |        |         |
|---------------------------------------|-------|-------|--------|--------|-------|--------|---------|
| X, volume / capacity                  | 0.16  | 0.17  | 0.98   | 0.83   | 0.62  | 0.42   | 2.86    |
| d, Delay for Lane Group [s/veh]       | 8.63  | 8.66  | 46.71  | 20.19  | 71.67 | 47.80  | 893.59  |
| Lane Group LOS                        | A     | A     | D      | C      | E     | D      | F       |
| Critical Lane Group                   | No    | No    | Yes    | No     | Yes   | No     | Yes     |
| 50th-Percentile Queue Length [veh/ln] | 2.03  | 2.03  | 16.93  | 14.99  | 0.98  | 2.99   | 93.31   |
| 50th-Percentile Queue Length [ft/ln]  | 50.64 | 50.81 | 423.26 | 374.77 | 24.59 | 74.86  | 2332.78 |
| 95th-Percentile Queue Length [veh/ln] | 3.65  | 3.66  | 23.68  | 21.34  | 1.77  | 5.39   | 145.96  |
| 95th-Percentile Queue Length [ft/ln]  | 91.15 | 91.46 | 591.96 | 533.52 | 44.27 | 134.75 | 3648.96 |

**Movement, Approach, & Intersection Results**

|                                 |        |      |      |       |       |      |       |       |       |        |      |        |
|---------------------------------|--------|------|------|-------|-------|------|-------|-------|-------|--------|------|--------|
| d_M, Delay for Movement [s/veh] | 0.00   | 8.64 | 8.66 | 46.71 | 26.08 | 0.00 | 71.67 | 71.67 | 71.67 | 47.80  | 0.00 | 893.59 |
| Movement LOS                    |        | A    | A    | D     | C     |      | E     | E     | E     | D      |      | F      |
| d_A, Approach Delay [s/veh]     | 8.64   |      |      | 33.22 |       |      | 71.67 |       |       | 813.11 |      |        |
| Approach LOS                    | A      |      |      | C     |       |      | E     |       |       | F      |      |        |
| d_I, Intersection Delay [s/veh] | 312.07 |      |      |       |       |      |       |       |       |        |      |        |
| Intersection LOS                | F      |      |      |       |       |      |       |       |       |        |      |        |
| Intersection V/C                | 0.941  |      |      |       |       |      |       |       |       |        |      |        |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 13: US 1 Alt/Decatur St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 44.0  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.750

#### Intersection Setup

| Name                   | US 1 ALT                                                                          |        | Decatur St                                                                         |        | US 1 ALT                                                                            |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Westbound                                                                          |        | Southwestbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Right  | Left                                                                                | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 1      | 0                                                                                  | 1      | 1                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | No                                                                                  |        |

#### Volumes

| Name                                    | US 1 ALT |        | Decatur St |        | US 1 ALT |        |
|-----------------------------------------|----------|--------|------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 667      | 49     | 139        | 332    | 119      | 432    |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000     | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.13     | 2.13   | 1.97       | 2.00   | 2.63     | 2.00   |
| Growth Rate                             | 1.00     | 1.00   | 1.00       | 1.00   | 1.00     | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0          | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 5        | 0      | 0          | 0      | 0        | 18     |
| Diverted Trips [veh/h]                  | 0        | 0      | 0          | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0          | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0          | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0          | 0      | 0        | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0          | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 672      | 49     | 139        | 332    | 119      | 450    |
| Peak Hour Factor                        | 0.9000   | 0.9000 | 0.9000     | 0.9000 | 0.9000   | 0.9000 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000     | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 187      | 14     | 39         | 92     | 33       | 125    |
| Total Analysis Volume [veh/h]           | 747      | 54     | 154        | 369    | 132      | 500    |
| Presence of On-Street Parking           | No       | No     | No         | No     | No       | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0          | 0      | 0        | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0          | 0      | 0        | 0      |
| Pedestrian Volume [ped/h]               | 0        |        | 0          |        | 0        |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0          |        | 0        |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 80             |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 15.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 9.00           |

**Phasing & Timing**

| Control Type                 | Permissive | Unsignalized | Split | Split | ProtectedPermissi | Permissive |
|------------------------------|------------|--------------|-------|-------|-------------------|------------|
| Signal group                 | 6          | 0            | 4     | 0     | 5                 | 2          |
| Auxiliary Signal Groups      |            |              |       |       |                   |            |
| Lead / Lag                   | -          | -            | Lag   | -     | Lead              | -          |
| Minimum Green [s]            | 10         | 0            | 5     | 0     | 4                 | 10         |
| Maximum Green [s]            | 39         | 0            | 15    | 0     | 10                | 54         |
| Amber [s]                    | 5.0        | 0.0          | 4.0   | 0.0   | 4.0               | 5.0        |
| All red [s]                  | 1.0        | 0.0          | 1.0   | 0.0   | 1.0               | 1.0        |
| Split [s]                    | 30         | 0            | 30    | 0     | 30                | 30         |
| Vehicle Extension [s]        | 0.2        | 0.0          | 3.0   | 0.0   | 3.0               | 0.2        |
| Walk [s]                     | 0          | 0            | 0     | 0     | 0                 | 0          |
| Pedestrian Clearance [s]     | 0          | 0            | 0     | 0     | 0                 | 0          |
| Rest In Walk                 | No         |              | No    |       |                   | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 0.0          | 2.0   | 0.0   | 2.0               | 2.0        |
| I2, Clearance Lost Time [s]  | 4.0        | 0.0          | 3.0   | 0.0   | 3.0               | 4.0        |
| Minimum Recall               | No         |              | No    |       | No                | No         |
| Maximum Recall               | Yes        |              | No    |       | No                | Yes        |
| Pedestrian Recall            | No         |              | No    |       | No                | No         |
| Detector Location [ft]       | 0.0        | 0.0          | 0.0   | 0.0   | 0.0               | 0.0        |
| Detector Length [ft]         | 30.0       | 0.0          | 30.0  | 0.0   | 30.0              | 30.0       |
| I, Upstream Filtering Factor | 1.00       | 1.00         | 1.00  | 1.00  | 1.00              | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L     | R      | L    | C    |
|-----------------------------------------|-------|-------|--------|------|------|
| C, Cycle Length [s]                     | 80    | 80    | 80     | 80   | 80   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 5.00  | 5.00   | 6.00 | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00   | 0.00 | 0.00 |
| l2, Clearance Lost Time [s]             | 4.00  | 3.00  | 3.00   | 0.00 | 4.00 |
| g_i, Effective Green Time [s]           | 45    | 15    | 15     | 54   | 54   |
| g / C, Green / Cycle                    | 0.56  | 0.19  | 0.19   | 0.68 | 0.68 |
| (v / s)_i Volume / Saturation Flow Rate | 0.40  | 0.09  | 0.23   | 0.16 | 0.27 |
| s, saturation flow rate [veh/h]         | 1860  | 1775  | 1583   | 845  | 1863 |
| c, Capacity [veh/h]                     | 1045  | 333   | 297    | 487  | 1257 |
| d1, Uniform Delay [s]                   | 12.85 | 28.92 | 32.50  | 9.24 | 5.78 |
| k, delay calibration                    | 0.50  | 0.11  | 0.50   | 0.50 | 0.50 |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00   | 1.00 | 1.00 |
| d2, Incremental Delay [s]               | 4.19  | 1.00  | 134.53 | 1.37 | 0.94 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00   | 0.00 | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00   | 1.00 | 1.00 |
| PF, progression factor                  | 1.00  | 1.00  | 1.00   | 1.00 | 1.00 |

**Lane Group Results**

|                                       |        |        |        |       |        |
|---------------------------------------|--------|--------|--------|-------|--------|
| X, volume / capacity                  | 0.72   | 0.46   | 1.24   | 0.27  | 0.40   |
| d, Delay for Lane Group [s/veh]       | 17.04  | 29.92  | 167.03 | 10.61 | 6.72   |
| Lane Group LOS                        | B      | C      | F      | B     | A      |
| Critical Lane Group                   | Yes    | No     | Yes    | Yes   | No     |
| 50th-Percentile Queue Length [veh/ln] | 9.75   | 2.65   | 16.64  | 0.80  | 3.29   |
| 50th-Percentile Queue Length [ft/ln]  | 243.66 | 66.28  | 415.94 | 20.10 | 82.34  |
| 95th-Percentile Queue Length [veh/ln] | 14.87  | 4.77   | 25.82  | 1.45  | 5.93   |
| 95th-Percentile Queue Length [ft/ln]  | 371.66 | 119.30 | 645.43 | 36.19 | 148.22 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |        |        |       |      |
|---------------------------------|-------|------|--------|--------|-------|------|
| d_M, Delay for Movement [s/veh] | 17.04 | 0.00 | 29.92  | 167.03 | 10.61 | 6.72 |
| Movement LOS                    | B     |      | C      | F      | B     | A    |
| d_A, Approach Delay [s/veh]     | 17.04 |      | 126.66 |        | 7.53  |      |
| Approach LOS                    | B     |      | F      |        | A     |      |
| d_I, Intersection Delay [s/veh] | 44.02 |      |        |        |       |      |
| Intersection LOS                | D     |      |        |        |       |      |
| Intersection V/C                | 0.750 |      |        |        |       |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 14: US 1 Alt/Charles Armentrout St

|                  |              |                           |          |
|------------------|--------------|---------------------------|----------|
| Control Type:    | Two-way stop | Delay (sec / veh):        | 10,000.0 |
| Analysis Method: | HCM 2010     | Level Of Service:         | F        |
| Analysis Period: | 15 minutes   | Volume to Capacity (v/c): | 0.000    |

#### Intersection Setup

| Name                   | US 1 Alt                                                                          |        | US 1 ALT                                                                           |        | Charles L Armentrout                                                                |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1 Alt |        | US 1 ALT |        | Charles L Armentrout |        |
|-----------------------------------------|----------|--------|----------|--------|----------------------|--------|
| Base Volume Input [veh/h]               | 1070     | 786    | 481      | 146    | 18                   | 572    |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000   | 1.0000 | 1.0000               | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.08     | 2.00   | 2.00     | 2.00   | 3.85                 | 2.17   |
| Growth Rate                             | 1.00     | 1.00   | 1.00     | 1.00   | 1.00                 | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0        | 0      | 0                    | 0      |
| Site-Generated Trips [veh/h]            | 3        | 5      | 18       | 0      | 0                    | 12     |
| Diverted Trips [veh/h]                  | 0        | 0      | 0        | 0      | 0                    | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0        | 0      | 0                    | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0        | 0      | 0                    | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0        | 0      | 0                    | 0      |
| Total Hourly Volume [veh/h]             | 1073     | 791    | 499      | 146    | 18                   | 584    |
| Peak Hour Factor                        | 0.9000   | 0.9000 | 0.9000   | 0.9000 | 0.9000               | 0.9000 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000   | 1.0000 | 1.0000               | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 298      | 220    | 139      | 41     | 5                    | 162    |
| Total Analysis Volume [veh/h]           | 1192     | 879    | 554      | 162    | 20                   | 649    |
| Pedestrian Volume [ped/h]               | 0        |        | 0        |        | 0                    |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |         |      |      |      |          |        |
|---------------------------------------|---------|------|------|------|----------|--------|
| V/C, Movement V/C Ratio               | 1.35    | 0.01 | 0.01 | 0.00 | 0.00     | 1.22   |
| d_M, Delay for Movement [s/veh]       | 180.15  | 0.00 | 0.00 | 0.00 | 10000.00 | 140.09 |
| Movement LOS                          | F       | A    | A    | A    | F        | F      |
| 95th-Percentile Queue Length [veh/ln] | 47.82   | 0.00 | 0.00 | 0.00 | 4.26     | 24.57  |
| 95th-Percentile Queue Length [ft/ln]  | 1195.52 | 0.00 | 0.00 | 0.00 | 106.51   | 614.34 |
| d_A, Approach Delay [s/veh]           | 103.69  |      | 0.00 |      | 434.86   |        |
| Approach LOS                          | F       |      | A    |      | F        |        |
| d_I, Intersection Delay [s/veh]       | 146.31  |      |      |      |          |        |
| Intersection LOS                      | F       |      |      |      |          |        |

### Intersection Level Of Service Report

#### Intersection 15: US 1/Gallatin St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 3.7  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.331

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Gallatin St. |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|--------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound    |        |
| Lane Configuration     |  |        |  |        |              |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left         | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00        | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0            | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00       | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 0.00         |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00         |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | No           |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Gallatin St. |        |
|-----------------------------------------|--------|--------|--------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 18     | 341    | 952    | 65     | 0            | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.11   | 2.05   | 0.00   | 0.00         | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00         | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0      | 3      | 13     | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0            | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 18     | 344    | 965    | 65     | 0            | 0      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000       | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 5      | 96     | 268    | 18     | 0            | 0      |
| Total Analysis Volume [veh/h]           | 20     | 382    | 1072   | 72     | 0            | 0      |
| Presence of On-Street Parking           | No     | No     | No     | No     |              |        |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0            | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0            | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0            |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0            |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 111                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Semi-actuated                   |
| Offset [s]                | 2.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 6.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
|------------------------------|------------|------------|------------|------------|------------|------------|
| Signal group                 | 6          | 6          | 2          | 2          | 0          | 0          |
| Auxiliary Signal Groups      |            |            |            |            |            |            |
| Lead / Lag                   | Lag        | -          | -          | -          | -          | -          |
| Minimum Green [s]            | 4          | 4          | 4          | 4          | 0          | 0          |
| Maximum Green [s]            | 86         | 86         | 86         | 86         | 0          | 0          |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 0.0        | 0.0        |
| All red [s]                  | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Split [s]                    | 90         | 90         | 90         | 90         | 0          | 0          |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 0.0        | 0.0        |
| Walk [s]                     | 0          | 0          | 0          | 0          | 0          | 0          |
| Pedestrian Clearance [s]     | 0          | 0          | 0          | 0          | 0          | 0          |
| Rest In Walk                 |            |            |            |            |            |            |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 0.0        | 0.0        |
| I2, Clearance Lost Time [s]  | 2.0        | 2.0        | 2.0        | 2.0        | 0.0        | 0.0        |
| Minimum Recall               |            | No         | No         |            |            |            |
| Maximum Recall               |            | Yes        | Yes        |            |            |            |
| Pedestrian Recall            |            | No         | No         |            |            |            |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |    |
|--------------------------|----|
| Pedestrian Signal Group  | 8  |
| Pedestrian Walk [s]      | 20 |
| Pedestrian Clearance [s] | 10 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C    | C    |  |
|-----------------------------------------|------|------|------|------|--|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  |  |
| L, Total Lost Time per Cycle [s]        | 4.00 | 4.00 | 4.00 | 4.00 |  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 0.00 |  |
| l2, Clearance Lost Time [s]             | 2.00 | 2.00 | 2.00 | 2.00 |  |
| g_i, Effective Green Time [s]           | 97   | 97   | 97   | 97   |  |
| g / C, Green / Cycle                    | 0.81 | 0.81 | 0.81 | 0.81 |  |
| (v / s)_i Volume / Saturation Flow Rate | 0.13 | 0.12 | 0.31 | 0.31 |  |
| s, saturation flow rate [veh/h]         | 1519 | 1693 | 1862 | 1821 |  |
| c, Capacity [veh/h]                     | 1260 | 1368 | 1504 | 1471 |  |
| d1, Uniform Delay [s]                   | 2.48 | 2.53 | 3.21 | 3.24 |  |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 |  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 |  |
| d2, Incremental Delay [s]               | 0.26 | 0.23 | 0.73 | 0.78 |  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 |  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 |  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 |  |

**Lane Group Results**

|                                       |       |       |        |        |  |
|---------------------------------------|-------|-------|--------|--------|--|
| X, volume / capacity                  | 0.16  | 0.15  | 0.38   | 0.39   |  |
| d, Delay for Lane Group [s/veh]       | 2.75  | 2.76  | 3.94   | 4.01   |  |
| Lane Group LOS                        | A     | A     | A      | A      |  |
| Critical Lane Group                   | No    | No    | No     | Yes    |  |
| 50th-Percentile Queue Length [veh/ln] | 0.86  | 0.91  | 3.21   | 3.25   |  |
| 50th-Percentile Queue Length [ft/ln]  | 21.61 | 22.79 | 80.25  | 81.24  |  |
| 95th-Percentile Queue Length [veh/ln] | 1.56  | 1.64  | 5.78   | 5.85   |  |
| 95th-Percentile Queue Length [ft/ln]  | 38.89 | 41.02 | 144.44 | 146.24 |  |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |      |      |
|---------------------------------|-------|------|------|------|------|------|
| d_M, Delay for Movement [s/veh] | 2.75  | 2.75 | 3.97 | 4.01 | 0.00 | 0.00 |
| Movement LOS                    | A     | A    | A    | A    |      |      |
| d_A, Approach Delay [s/veh]     | 2.75  |      | 3.98 |      | 0.00 |      |
| Approach LOS                    | A     |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh] | 3.66  |      |      |      |      |      |
| Intersection LOS                | A     |      |      |      |      |      |
| Intersection V/C                | 0.331 |      |      |      |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 90s

SG: 8 30s

SG: 6 90s

### Intersection Level Of Service Report Intersection 16: US 1/Farragut St

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 9.9  
Level Of Service: A  
Volume to Capacity (v/c): 0.332

#### Intersection Setup

| Name                   | US 1                                                                              |        | Farragut                                                                           |        | US 1                                                                                |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Southbound                                                                        |        | Eastbound                                                                          |        | Northeastbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Right  | Left                                                                                | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 150.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 25.00                                                                              |        | 35.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | Farragut |        | US 1   |        |
|-----------------------------------------|--------|--------|----------|--------|--------|--------|
| Base Volume Input [veh/h]               | 942    | 3      | 35       | 25     | 10     | 301    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.97   | 0.00   | 0.00     | 0.00   | 0.00   | 2.11   |
| Growth Rate                             | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0        | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 13     | 0      | 0        | 0      | 0      | 3      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0        | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0        | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0        | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0        | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0        | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 955    | 3      | 35       | 25     | 10     | 304    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 265    | 1      | 10       | 7      | 3      | 84     |
| Total Analysis Volume [veh/h]           | 1061   | 3      | 39       | 28     | 11     | 338    |
| Presence of On-Street Parking           | No     | No     | No       | No     | No     | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0        | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0        | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0        |        | 0      |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0        |        | 0      |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 96.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Split | Split | Permissive | Permissive |
|------------------------------|------------|------------|-------|-------|------------|------------|
| Signal group                 | 6          | 6          | 4     | 4     | 2          | 2          |
| Auxiliary Signal Groups      |            |            |       |       |            |            |
| Lead / Lag                   | -          | -          | Lag   | -     | Lag        | -          |
| Minimum Green [s]            | 20         | 20         | 20    | 20    | 20         | 20         |
| Maximum Green [s]            | 83         | 83         | 26    | 26    | 83         | 83         |
| Amber [s]                    | 5.0        | 5.0        | 4.0   | 4.0   | 5.0        | 5.0        |
| All red [s]                  | 1.0        | 1.0        | 1.0   | 1.0   | 1.0        | 1.0        |
| Split [s]                    | 89         | 89         | 31    | 31    | 89         | 89         |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0   | 3.0   | 3.0        | 3.0        |
| Walk [s]                     | 0          | 0          | 7     | 7     | 0          | 0          |
| Pedestrian Clearance [s]     | 0          | 0          | 13    | 13    | 0          | 0          |
| Rest In Walk                 | No         |            | No    |       |            | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0   | 2.0   | 2.0        | 2.0        |
| I2, Clearance Lost Time [s]  | 4.0        | 4.0        | 3.0   | 3.0   | 4.0        | 4.0        |
| Minimum Recall               | No         |            | No    |       |            | No         |
| Maximum Recall               | Yes        |            | Yes   |       |            | Yes        |
| Pedestrian Recall            | No         |            | No    |       |            | No         |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0   | 0.0   | 0.0        | 0.0        |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0  | 50.0  | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00  | 1.00  | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | L     | R     | C    |
|-----------------------------------------|------|------|-------|-------|------|
| C, Cycle Length [s]                     | 120  | 120  | 120   | 120   | 120  |
| L, Total Lost Time per Cycle [s]        | 6.00 | 6.00 | 5.00  | 5.00  | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00  | 0.00  | 2.00 |
| l2, Clearance Lost Time [s]             | 4.00 | 4.00 | 3.00  | 3.00  | 4.00 |
| g_i, Effective Green Time [s]           | 83   | 83   | 26    | 26    | 83   |
| g / C, Green / Cycle                    | 0.69 | 0.69 | 0.22  | 0.22  | 0.69 |
| (v / s)_i Volume / Saturation Flow Rate | 0.29 | 0.29 | 0.02  | 0.02  | 0.19 |
| s, saturation flow rate [veh/h]         | 1863 | 1862 | 1810  | 1615  | 1798 |
| c, Capacity [veh/h]                     | 1289 | 1288 | 392   | 350   | 1275 |
| d1, Uniform Delay [s]                   | 7.98 | 7.99 | 37.63 | 37.47 | 7.02 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50  | 0.50  | 0.50 |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |
| d2, Incremental Delay [s]               | 0.98 | 0.98 | 0.51  | 0.45  | 0.53 |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00  | 0.00  | 0.00 |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |
| PF, progression factor                  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |

**Lane Group Results**

|                                       |        |        |       |       |        |
|---------------------------------------|--------|--------|-------|-------|--------|
| X, volume / capacity                  | 0.41   | 0.41   | 0.10  | 0.08  | 0.27   |
| d, Delay for Lane Group [s/veh]       | 8.96   | 8.97   | 38.13 | 37.91 | 7.55   |
| Lane Group LOS                        | A      | A      | D     | D     | A      |
| Critical Lane Group                   | No     | Yes    | Yes   | No    | No     |
| 50th-Percentile Queue Length [veh/ln] | 5.86   | 5.86   | 0.99  | 0.71  | 3.27   |
| 50th-Percentile Queue Length [ft/ln]  | 146.38 | 146.45 | 24.75 | 17.79 | 81.67  |
| 95th-Percentile Queue Length [veh/ln] | 9.82   | 9.83   | 1.78  | 1.28  | 5.88   |
| 95th-Percentile Queue Length [ft/ln]  | 245.59 | 245.69 | 44.55 | 32.03 | 147.01 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |      |      |
|---------------------------------|-------|------|-------|-------|------|------|
| d_M, Delay for Movement [s/veh] | 8.96  | 8.97 | 38.13 | 37.91 | 7.55 | 7.55 |
| Movement LOS                    | A     | A    | D     | D     | A    | A    |
| d_A, Approach Delay [s/veh]     | 8.96  |      | 38.04 |       | 7.55 |      |
| Approach LOS                    | A     |      | D     |       | A    |      |
| d_I, Intersection Delay [s/veh] | 9.95  |      |       |       |      |      |
| Intersection LOS                | A     |      |       |       |      |      |
| Intersection V/C                | 0.332 |      |       |       |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 17: US 1/43rd Avenue

Control Type: Two-way stop  
 Analysis Method: HCM 6th Edition  
 Analysis Period: 15 minutes

Delay (sec / veh): 36.3  
 Level Of Service: E  
 Volume to Capacity (v/c): 0.049

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        |                                                                                     |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northeastbound                                                                    |        | Southwestbound                                                                     |        | Southeastbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 35.00                                                                             |        | 35.00                                                                              |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 112    | 331    | 895    | 57     | 6      | 85     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 3      | 13     | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 112    | 334    | 908    | 57     | 6      | 85     |
| Peak Hour Factor                        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 28     | 84     | 227    | 14     | 2      | 21     |
| Total Analysis Volume [veh/h]           | 112    | 334    | 908    | 57     | 6      | 85     |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0      |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |      |      |       |       |
|---------------------------------------|-------|------|------|------|-------|-------|
| V/C, Movement V/C Ratio               | 0.16  | 0.00 | 0.01 | 0.00 | 0.05  | 0.16  |
| d_M, Delay for Movement [s/veh]       | 11.02 | 0.00 | 0.00 | 0.00 | 36.33 | 13.96 |
| Movement LOS                          | B     | A    | A    | A    | E     | B     |
| 95th-Percentile Queue Length [veh/ln] | 0.56  | 0.00 | 0.00 | 0.00 | 0.78  | 0.78  |
| 95th-Percentile Queue Length [ft/ln]  | 13.96 | 0.00 | 0.00 | 0.00 | 19.46 | 19.46 |
| d_A, Approach Delay [s/veh]           | 2.77  |      | 0.00 |      | 15.44 |       |
| Approach LOS                          | A     |      | A    |      | C     |       |
| d_I, Intersection Delay [s/veh]       | 1.76  |      |      |      |       |       |
| Intersection LOS                      | E     |      |      |      |       |       |

### Intersection Level Of Service Report

#### Intersection 18: US 1/42nd Place/Crittenden St

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 33.3  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.888 |

#### Intersection Setup

| Name                   | 42nd Pl                                                                           |        |        | Crittenden St                                                                     |        |        | US 1                                                                                |        |        | US 1                                                                                |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Southbound                                                                        |        |        | Eastbound                                                                         |        |        | Northeastbound                                                                      |        |        | Southwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Right  | Right2 | Left                                                                              | Thru   | Right  | Left2                                                                               | Left   | Thru   | Thru                                                                                | Right  | Right2 |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 150.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 25.00                                                                             |        |        | 25.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

#### Volumes

| Name                                    | 42nd Pl |        |        | Crittenden St |        |        | US 1   |        |        | US 1   |        |        |
|-----------------------------------------|---------|--------|--------|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 1       | 14     | 0      | 0             | 23     | 257    | 286    | 14     | 426    | 940    | 20     | 5      |
| Base Volume Adjustment Factor           | 1.0000  | 1.0000 | 1.0000 | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00    | 0.00   | 0.00   | 0.00          | 0.00   | 2.00   | 2.14   | 0.00   | 2.17   | 2.05   | 0.00   | 0.00   |
| Growth Rate                             | 1.00    | 1.00   | 1.00   | 1.00          | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0       | 0      | 0      | 0             | 0      | 12     | 3      | 0      | 3      | 13     | 0      | 0      |
| Diverted Trips [veh/h]                  | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 1       | 14     | 0      | 0             | 23     | 269    | 289    | 14     | 429    | 953    | 20     | 5      |
| Peak Hour Factor                        | 0.9000  | 0.9000 | 0.9000 | 1.0000        | 0.9000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000  | 1.0000 | 1.0000 | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0       | 4      | 0      | 0             | 6      | 75     | 72     | 4      | 119    | 265    | 6      | 1      |
| Total Analysis Volume [veh/h]           | 1       | 16     | 0      | 0             | 26     | 299    | 289    | 16     | 477    | 1059   | 22     | 6      |
| Presence of On-Street Parking           | No      |        | No     | No            |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0       |        |        | 0             |        |        | 0      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0       |        |        | 0             |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 12.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Signal group                 | 4     | 4     | 4     | 0     | 3     | 3     | 0     | 6     | 6     | 6     | 6     | 6     |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |       |       |       |       |
| Lead / Lag                   | Lag   | -     | -     | -     | -     | -     | -     | Lag   | -     | -     | -     | -     |
| Minimum Green [s]            | 5     | 5     | 5     | 0     | 5     | 5     | 0     | 20    | 20    | 20    | 20    | 20    |
| Maximum Green [s]            | 19    | 19    | 19    | 0     | 25    | 25    | 0     | 60    | 60    | 60    | 60    | 60    |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 0.0   | 4.0   | 4.0   | 0.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 0.0   | 1.0   | 1.0   | 0.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   |
| Split [s]                    | 24    | 24    | 24    | 0     | 30    | 30    | 0     | 66    | 66    | 66    | 66    | 66    |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Rest In Walk                 | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 0.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   |
| Minimum Recall               | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| Maximum Recall               | No    |       |       |       | No    |       |       |       | Yes   | Yes   |       |       |
| Pedestrian Recall            | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0  | 50.0  | 50.0  | 0.0   | 50.0  | 50.0  | 0.0   | 50.0  | 50.0  | 50.0  | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C    | C     | C     |
|-----------------------------------------|-------|-------|-------|------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120  | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 6.00  | 6.00 | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 2.00  | 0.00 | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 4.00  | 4.00 | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 2     | 25    | 77    | 77   | 77    | 77    |
| g / C, Green / Cycle                    | 0.02  | 0.21  | 0.64  | 0.64 | 0.64  | 0.64  |
| (v / s)_i Volume / Saturation Flow Rate | 0.01  | 0.20  | 0.59  | 0.13 | 0.29  | 0.29  |
| s, saturation flow rate [veh/h]         | 1625  | 1635  | 517   | 3541 | 1862  | 1845  |
| c, Capacity [veh/h]                     | 31    | 341   | 300   | 2263 | 1190  | 1179  |
| d1, Uniform Delay [s]                   | 58.34 | 46.94 | 37.68 | 9.03 | 11.03 | 11.07 |
| k, delay calibration                    | 0.11  | 0.38  | 0.50  | 0.50 | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 14.13 | 32.73 | 56.10 | 0.21 | 1.26  | 1.30  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |        |        |
|---------------------------------------|-------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.55  | 0.95   | 1.02   | 0.21   | 0.46   | 0.46   |
| d, Delay for Lane Group [s/veh]       | 72.47 | 79.67  | 93.79  | 9.24   | 12.29  | 12.37  |
| Lane Group LOS                        | E     | E      | F      | A      | B      | B      |
| Critical Lane Group                   | Yes   | Yes    | Yes    | No     | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 0.64  | 12.72  | 13.75  | 2.52   | 7.25   | 7.28   |
| 50th-Percentile Queue Length [ft/ln]  | 15.96 | 318.06 | 343.75 | 62.98  | 181.19 | 182.00 |
| 95th-Percentile Queue Length [veh/ln] | 1.15  | 18.57  | 20.09  | 4.53   | 11.66  | 11.71  |
| 95th-Percentile Queue Length [ft/ln]  | 28.73 | 464.31 | 502.13 | 113.36 | 291.56 | 292.63 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |      |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 72.47 | 72.47 | 72.47 | 0.00  | 79.67 | 79.67 | 93.79 | 93.79 | 9.24 | 12.33 | 12.37 | 12.37 |
| Movement LOS                    | E     | E     | E     |       | E     | E     | F     | F     | A    | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 72.47 |       |       | 79.67 |       |       | 42.21 |       |      | 12.33 |       |       |
| Approach LOS                    | E     |       |       | E     |       |       | D     |       |      | B     |       |       |
| d_I, Intersection Delay [s/veh] | 33.26 |       |       |       |       |       |       |       |      |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |      |       |       |       |
| Intersection V/C                | 0.888 |       |       |       |       |       |       |       |      |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | - | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**  
**Intersection 19: US 1/41st Place/Charles Armentrout Drive**

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 42.9  |
| Analysis Method: | HCM 2010   | Level Of Service:         | D     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.946 |

**Intersection Setup**

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Charles L Armentrout                                                                |        |        | 41st                                                                                |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 200.00                                                                            | 100.00 | 200.00 | 200.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 43.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                    | US 1   |        |        | US 1   |        |        | Charles L Armentrout |        |        | 41st   |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|----------------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 3      | 233    | 207    | 409    | 825    | 1      | 644                  | 4      | 505    | 2      | 2      | 3      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.00   | 2.38   | 2.14   | 2.00   | 0.00   | 2.00                 | 0.00   | 2.21   | 0.00   | 0.00   | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00                 | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 3      | 0      | 12     | 13     | 0      | 0                    | 0      | 3      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 3      | 236    | 207    | 421    | 838    | 1      | 644                  | 4      | 508    | 2      | 2      | 3      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000               | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1      | 66     | 58     | 117    | 233    | 0      | 179                  | 1      | 141    | 1      | 1      | 1      |
| Total Analysis Volume [veh/h]           | 3      | 262    | 230    | 468    | 931    | 1      | 716                  | 4      | 564    | 2      | 2      | 3      |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No                   |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 4      |        |        | 0      |        |        | 0                    |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0                    |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 42.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Overlap | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 6       | 6       | 6       | 5        | 2       | 2       | 8       | 8       | 2       | 4       | 4       | 4       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |         |         | 2,5     |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 20      | 5        | 20      | 20      | 8       | 8       | 20      | 8       | 8       | 8       |
| Maximum Green [s]            | 25      | 25      | 25      | 18       | 48      | 48      | 60      | 60      | 48      | 60      | 60      | 60      |
| Amber [s]                    | 5.0     | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     | 4.0     | 4.0     | 5.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0     | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     | 2.0     | 2.0     | 1.0     | 2.0     | 2.0     | 2.0     |
| Split [s]                    | 31      | 31      | 31      | 23       | 54      | 54      | 66      | 66      | 54      | 66      | 66      | 66      |
| Vehicle Extension [s]        | 6.0     | 6.0     | 6.0     | 3.0      | 6.0     | 6.0     | 3.0     | 3.0     | 6.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |          | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0     | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| Minimum Recall               |         | No      |         | No       | No      |         |         | No      | No      |         | No      |         |
| Maximum Recall               |         | Yes     |         | No       | Yes     |         |         | No      | Yes     |         | No      |         |
| Pedestrian Recall            |         | No      |         | No       | No      |         |         | No      | No      |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 50.0    | 50.0    | 50.0    | 50.0     | 50.0    | 50.0    | 50.0    | 50.0    | 0.0     | 50.0    | 50.0    | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | C     | C     | R     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 5.50  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 2.00  | 0.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 4.00  | 4.00  | 4.00  | 0.00  | 4.00  | 4.00  | 4.00  | 0.00  | 4.00  |
| g_i, Effective Green Time [s]           | 25    | 25    | 25    | 48    | 48    | 48    | 60    | 48    | 60    |
| g / C, Green / Cycle                    | 0.21  | 0.21  | 0.21  | 0.40  | 0.40  | 0.40  | 0.50  | 0.40  | 0.50  |
| (v / s)_i Volume / Saturation Flow Rate | 0.00  | 0.07  | 0.15  | 0.33  | 0.25  | 0.25  | 0.50  | 0.36  | 0.00  |
| s, saturation flow rate [veh/h]         | 610   | 3547  | 1577  | 1400  | 1863  | 1862  | 1443  | 1580  | 1874  |
| c, Capacity [veh/h]                     | 60    | 739   | 329   | 580   | 745   | 745   | 782   | 632   | 975   |
| d1, Uniform Delay [s]                   | 60.00 | 40.60 | 44.02 | 31.51 | 28.81 | 28.81 | 29.70 | 33.59 | 15.06 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.45  | 0.50  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.57  | 1.33  | 11.75 | 11.47 | 3.94  | 3.95  | 16.51 | 17.38 | 0.00  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |        |        |        |        |       |
|---------------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.05  | 0.35   | 0.70   | 0.81   | 0.63   | 0.63   | 0.92   | 0.89   | 0.01  |
| d, Delay for Lane Group [s/veh]       | 61.57 | 41.94  | 55.77  | 42.98  | 32.75  | 32.75  | 46.22  | 50.97  | 15.06 |
| Lane Group LOS                        | E     | D      | E      | D      | C      | C      | D      | D      | B     |
| Critical Lane Group                   | No    | No     | Yes    | No     | No     | No     | Yes    | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.12  | 3.38   | 7.24   | 12.59  | 11.31  | 11.31  | 23.68  | 18.26  | 0.10  |
| 50th-Percentile Queue Length [ft/ln]  | 2.89  | 84.45  | 181.07 | 314.74 | 282.86 | 282.79 | 591.96 | 456.51 | 2.48  |
| 95th-Percentile Queue Length [veh/ln] | 0.21  | 6.08   | 11.66  | 18.41  | 16.83  | 16.83  | 31.66  | 25.27  | 0.18  |
| 95th-Percentile Queue Length [ft/ln]  | 5.21  | 152.01 | 291.41 | 460.22 | 420.77 | 420.69 | 791.47 | 631.72 | 4.47  |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 61.57 | 41.94 | 55.77 | 42.98 | 32.75 | 32.75 | 46.22 | 46.22 | 50.97 | 15.06 | 15.06 | 15.06 |
| Movement LOS                    | E     | D     | E     | D     | C     | C     | D     | D     | D     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 48.48 |       |       | 36.17 |       |       | 48.30 |       |       | 15.06 |       |       |
| Approach LOS                    | D     |       |       | D     |       |       | D     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 42.93 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.946 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 20: MD 410/Toledo Terrace

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 180.1  
 Level Of Service: F  
 Volume to Capacity (v/c): 32.667

#### Intersection Setup

| Name                   |                                                                                   |        |        | Toledo Terrace                                                                    |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 500.00                                                                              | 100.00 | 900.00 | 175.00                                                                              | 100.00 | 175.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 50.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Toledo Terrace |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 93     | 5      | 80     | 167            | 22     | 235    | 135    | 683    | 153    | 71     | 1109   | 89     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.44   | 0.00   | 2.50   | 2.38           | 0.00   | 1.96   | 2.07   | 2.00   | 1.92   | 2.00   | 2.05   | 3.85   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00           | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 43     | 0      | 0      | 0              | 0      | 0      | 0      | 6      | 11     | 0      | 26     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 136    | 5      | 80     | 167            | 22     | 235    | 135    | 689    | 164    | 71     | 1135   | 89     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000         | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 38     | 1      | 22     | 46             | 6      | 65     | 38     | 191    | 46     | 20     | 315    | 25     |
| Total Analysis Volume [veh/h]           | 151    | 6      | 89     | 186            | 24     | 261    | 150    | 766    | 182    | 79     | 1261   | 99     |
| Presence of On-Street Parking           | No     |        | No     | No             |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 4      |        |        | 2              |        |        | 1      |        |        | 5      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0              |        |        | 0      |        |        | 0      |        |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 9.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|---------|---------|
| Signal group                 | 8       | 8       | 8       | 4       | 4       | 4       | 1        | 6       | 6       | 2       | 2       | 2       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lead     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 8       | 8       | 8       | 8       | 8       | 8       | 5        | 20      | 20      | 20      | 20      | 20      |
| Maximum Green [s]            | 36      | 36      | 36      | 36      | 36      | 36      | 25       | 102     | 102     | 72      | 72      | 72      |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0      | 4.5     | 4.5     | 4.5     | 4.5     | 4.5     |
| All red [s]                  | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 1.0      | 1.5     | 1.5     | 1.5     | 1.5     | 1.5     |
| Split [s]                    | 42      | 42      | 42      | 42      | 42      | 42      | 30       | 108     | 108     | 78      | 78      | 78      |
| Vehicle Extension [s]        | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0      | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         |         | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | Yes     |         |         | Yes     |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C       | R     | C       | R     | L     | C    | R    | L     | C     | R     |
|-----------------------------------------|---------|-------|---------|-------|-------|------|------|-------|-------|-------|
| C, Cycle Length [s]                     | 150     | 150   | 150     | 150   | 150   | 150  | 150  | 150   | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 6.00    | 6.00  | 6.00    | 6.00  | 6.00  | 6.00 | 6.00 | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00    | 0.00  | 2.00    | 0.00  | 0.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 4.00    | 4.00  | 4.00    | 4.00  | 0.00  | 4.00 | 4.00 | 4.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 36      | 36    | 36      | 36    | 102   | 102  | 102  | 90    | 90    | 90    |
| g / C, Green / Cycle                    | 0.24    | 0.24  | 0.24    | 0.24  | 0.68  | 0.68 | 0.68 | 0.60  | 0.60  | 0.60  |
| (v / s)_i Volume / Saturation Flow Rate | 15.92   | 0.06  | 29.67   | 0.16  | 0.26  | 0.22 | 0.12 | 0.11  | 0.36  | 0.06  |
| s, saturation flow rate [veh/h]         | 10      | 1566  | 7       | 1582  | 567   | 3547 | 1580 | 698   | 3545  | 1553  |
| c, Capacity [veh/h]                     | 49      | 376   | 47      | 380   | 357   | 2412 | 1074 | 394   | 2131  | 933   |
| d1, Uniform Delay [s]                   | 74.27   | 45.93 | 75.00   | 51.88 | 14.28 | 9.80 | 8.68 | 21.46 | 18.52 | 12.75 |
| k, delay calibration                    | 0.50    | 0.11  | 0.50    | 0.20  | 0.50  | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00    | 1.00  | 1.00    | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1029.27 | 0.32  | 1610.42 | 4.08  | 3.59  | 0.35 | 0.34 | 1.14  | 1.22  | 0.23  |
| d3, Initial Queue Delay [s]             | 0.00    | 0.00  | 0.00    | 0.00  | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00    | 1.00  | 1.00    | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00    | 1.00  | 1.00    | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |         |        |         |        |       |        |       |       |        |       |
|---------------------------------------|---------|--------|---------|--------|-------|--------|-------|-------|--------|-------|
| X, volume / capacity                  | 3.17    | 0.24   | 4.47    | 0.69   | 0.42  | 0.32   | 0.17  | 0.20  | 0.59   | 0.11  |
| d, Delay for Lane Group [s/veh]       | 1103.54 | 46.25  | 1685.42 | 55.95  | 17.87 | 10.14  | 9.02  | 22.60 | 19.74  | 12.98 |
| Lane Group LOS                        | F       | D      | F       | E      | B     | B      | A     | C     | B      | B     |
| Critical Lane Group                   | No      | No     | Yes     | No     | Yes   | No     | No    | No    | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 16.06   | 2.75   | 22.83   | 9.43   | 1.92  | 4.78   | 2.06  | 1.68  | 13.12  | 1.44  |
| 50th-Percentile Queue Length [ft/ln]  | 401.39  | 68.74  | 570.66  | 235.66 | 48.00 | 119.42 | 51.61 | 41.88 | 327.93 | 35.95 |
| 95th-Percentile Queue Length [veh/ln] | 28.90   | 4.95   | 40.28   | 14.46  | 3.46  | 8.36   | 3.72  | 3.02  | 19.06  | 2.59  |
| 95th-Percentile Queue Length [ft/ln]  | 722.51  | 123.73 | 1007.06 | 361.54 | 86.40 | 209.03 | 92.90 | 75.38 | 476.43 | 64.70 |

**Movement, Approach, & Intersection Results**

|                                 |         |         |       |         |         |       |       |       |      |       |       |       |
|---------------------------------|---------|---------|-------|---------|---------|-------|-------|-------|------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 1103.54 | 1103.54 | 46.25 | 1685.42 | 1685.42 | 55.95 | 17.87 | 10.14 | 9.02 | 22.60 | 19.74 | 12.98 |
| Movement LOS                    | F       | F       | D     | F       | F       | E     | B     | B     | A    | C     | B     | B     |
| d_A, Approach Delay [s/veh]     | 721.02  |         |       | 782.47  |         |       | 11.01 |       |      | 19.43 |       |       |
| Approach LOS                    | F       |         |       | F       |         |       | B     |       |      | B     |       |       |
| d_I, Intersection Delay [s/veh] | 180.08  |         |       |         |         |       |       |       |      |       |       |       |
| Intersection LOS                | F       |         |       |         |         |       |       |       |      |       |       |       |
| Intersection V/C                | 32.667  |         |       |         |         |       |       |       |      |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 21: MD 410/Editors Park Dr

|                  |              |                           |       |
|------------------|--------------|---------------------------|-------|
| Control Type:    | Two-way stop | Delay (sec / veh):        | 383.9 |
| Analysis Method: | HCM 2010     | Level Of Service:         | F     |
| Analysis Period: | 15 minutes   | Volume to Capacity (v/c): | 1.214 |

#### Intersection Setup

| Name                   | Editors Park Dr                                                                   |        | MD 410                                                                             |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        | Eastbound                                                                          |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |  |        |  |        |        |
| Turning Movement       | Left                                                                              | Right  | Thru                                                                               | Right  | U-turn                                                                              | Left   | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 200.00 | 150.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 45.00                                                                              |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Editors Park Dr |        | MD 410 |        | MD 410 |        |        |
|-----------------------------------------|-----------------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 58              | 54     | 821    | 102    | 1      | 65     | 1280   |
| Base Volume Adjustment Factor           | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85            | 0.00   | 2.00   | 1.64   | 0.00   | 1.89   | 2.05   |
| Growth Rate                             | 1.00            | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0               | 130    | 6      | 0      | 0      | 32     | 26     |
| Diverted Trips [veh/h]                  | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 58              | 184    | 827    | 102    | 1      | 97     | 1306   |
| Peak Hour Factor                        | 0.9000          | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 16              | 51     | 230    | 28     | 0      | 27     | 363    |
| Total Analysis Volume [veh/h]           | 64              | 204    | 919    | 113    | 1      | 108    | 1451   |
| Pedestrian Volume [ped/h]               | 0               |        | 0      |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |        |        |      |      |       |       |      |
|---------------------------------------|--------|--------|------|------|-------|-------|------|
| V/C, Movement V/C Ratio               | 1.21   | 0.37   | 0.01 | 0.00 | 0.01  | 0.16  | 0.01 |
| d_M, Delay for Movement [s/veh]       | 383.85 | 322.07 | 0.00 | 0.00 | 25.83 | 11.47 | 0.00 |
| Movement LOS                          | F      | F      | A    | A    | D     | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 17.93  | 17.93  | 0.00 | 0.00 | 0.52  | 0.52  | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 448.22 | 448.22 | 0.00 | 0.00 | 12.97 | 12.97 | 0.00 |
| d_A, Approach Delay [s/veh]           | 336.83 |        | 0.00 |      | 0.81  |       |      |
| Approach LOS                          | F      |        | A    |      | A     |       |      |
| d_I, Intersection Delay [s/veh]       | 32.01  |        |      |      |       |       |      |
| Intersection LOS                      | F      |        |      |      |       |       |      |

### Intersection Level Of Service Report

#### Intersection 22: MD 410/Prince George's Plaza

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 13.2  |
| Analysis Method: | HCM 2010   | Level Of Service:         | B     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.400 |

#### Intersection Setup

| Name                   | Metro                                                                             |        |        | PG Plaza                                                                          |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 2                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 250.00                                                                            | 100.00 | 250.00 | 225.00                                                                              | 100.00 | 100.00 | 325.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Metro  |        |        | PG Plaza |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 76     | 11     | 66     | 30       | 16     | 18     | 98     | 790    | 59     | 57     | 1244   | 39     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.54   | 3.85   | 2.22   | 0.00     | 0.00   | 3.85   | 2.22   | 2.07   | 1.74   | 2.21   | 2.00   | 3.85   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 136    | 0      | 0      | 58     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 76     | 11     | 66     | 30       | 16     | 18     | 98     | 926    | 59     | 57     | 1302   | 39     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 21     | 3      | 18     | 8        | 4      | 5      | 27     | 257    | 16     | 16     | 362    | 11     |
| Total Analysis Volume [veh/h]           | 84     | 12     | 73     | 33       | 18     | 20     | 109    | 1029   | 66     | 63     | 1447   | 43     |
| Presence of On-Street Parking           | No     |        | No     | No       |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0        |        |        | 0      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0        |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 39.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 3     | 3     | 3     | 4     | 4     | 4     | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |          |         |         |          |         |         |
| Lead / Lag                   | Lag   | -     | -     | Lag   | -     | -     | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 5     | 5     | 5     | 5     | 5        | 20      | 20      | 5        | 20      | 20      |
| Maximum Green [s]            | 24    | 24    | 24    | 24    | 24    | 24    | 25       | 54      | 54      | 25       | 54      | 54      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   | 1.0      | 1.5     | 1.5     | 1.0      | 1.5     | 1.5     |
| Split [s]                    | 30    | 30    | 30    | 30    | 30    | 30    | 30       | 60      | 60      | 30       | 60      | 60      |
| Vehicle Extension [s]        | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5      | 5.0     | 5.0     | 2.5      | 5.0     | 5.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       | No    |       |       | No    |       |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.5   | 3.5   | 3.5   | 3.5   | 3.5   | 3.5   | 3.0      | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     |
| Minimum Recall               |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    |       |       | No    |       | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 294.0   | 294.0   | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 30.0  | 30.0  | 30.0  | 30.0     | 6.0     | 6.0     | 30.0     | 5.0     | 5.0     |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C     | L     | C     | R     | L    | C    | C    | L    | C    | R    |
|-----------------------------------------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150   | 150   | 150  | 150  | 150  | 150  | 150  | 150  |
| L, Total Lost Time per Cycle [s]        | 5.50  | 5.50  | 5.50  | 5.50  | 5.50  | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s]             | 3.50  | 3.50  | 3.50  | 3.50  | 3.50  | 0.00 | 4.00 | 4.00 | 0.00 | 4.00 | 4.00 |
| g_i, Effective Green Time [s]           | 10    | 10    | 5     | 5     | 5     | 118  | 108  | 108  | 118  | 108  | 108  |
| g / C, Green / Cycle                    | 0.07  | 0.07  | 0.03  | 0.03  | 0.03  | 0.79 | 0.72 | 0.72 | 0.79 | 0.72 | 0.72 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02  | 0.05  | 0.01  | 0.01  | 0.01  | 0.24 | 0.20 | 0.20 | 0.11 | 0.29 | 0.03 |
| s, saturation flow rate [veh/h]         | 3461  | 1589  | 3514  | 1900  | 1555  | 461  | 3544 | 1805 | 594  | 5074 | 1555 |
| c, Capacity [veh/h]                     | 234   | 108   | 112   | 61    | 50    | 392  | 2561 | 1304 | 500  | 3656 | 1120 |
| d1, Uniform Delay [s]                   | 66.80 | 68.87 | 70.96 | 70.97 | 71.21 | 5.09 | 7.26 | 7.26 | 4.02 | 8.20 | 6.03 |
| k, delay calibration                    | 0.08  | 0.08  | 0.08  | 0.08  | 0.08  | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s]               | 0.69  | 9.18  | 1.07  | 2.01  | 3.89  | 1.76 | 0.28 | 0.55 | 0.52 | 0.32 | 0.06 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

|                                       |       |        |       |       |       |       |        |        |       |        |       |
|---------------------------------------|-------|--------|-------|-------|-------|-------|--------|--------|-------|--------|-------|
| X, volume / capacity                  | 0.36  | 0.79   | 0.29  | 0.30  | 0.40  | 0.28  | 0.28   | 0.28   | 0.13  | 0.40   | 0.04  |
| d, Delay for Lane Group [s/veh]       | 67.49 | 78.05  | 72.04 | 72.98 | 75.10 | 6.85  | 7.54   | 7.81   | 4.54  | 8.52   | 6.09  |
| Lane Group LOS                        | E     | E      | E     | E     | E     | A     | A      | A      | A     | A      | A     |
| Critical Lane Group                   | No    | Yes    | No    | No    | Yes   | Yes   | No     | No     | No    | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 1.57  | 3.50   | 0.64  | 0.71  | 0.81  | 0.81  | 3.74   | 3.91   | 0.42  | 5.55   | 0.38  |
| 50th-Percentile Queue Length [ft/ln]  | 39.26 | 87.60  | 16.02 | 17.86 | 20.31 | 20.18 | 93.46  | 97.71  | 10.45 | 138.83 | 9.42  |
| 95th-Percentile Queue Length [veh/ln] | 2.83  | 6.31   | 1.15  | 1.29  | 1.46  | 1.45  | 6.73   | 7.03   | 0.75  | 9.42   | 0.68  |
| 95th-Percentile Queue Length [ft/ln]  | 70.66 | 157.68 | 28.83 | 32.15 | 36.56 | 36.33 | 168.23 | 175.87 | 18.82 | 235.45 | 16.95 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |      |      |      |      |      |      |
|---------------------------------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| d_M, Delay for Movement [s/veh] | 67.49 | 78.05 | 78.05 | 72.04 | 72.98 | 75.10 | 6.85 | 7.62 | 7.81 | 4.54 | 8.52 | 6.09 |
| Movement LOS                    | E     | E     | E     | E     | E     | E     | A    | A    | A    | A    | A    | A    |
| d_A, Approach Delay [s/veh]     | 72.80 |       |       | 73.14 |       |       | 7.56 |      |      | 8.29 |      |      |
| Approach LOS                    | E     |       |       | E     |       |       | A    |      |      | A    |      |      |
| d_I, Intersection Delay [s/veh] | 13.17 |       |       |       |       |       |      |      |      |      |      |      |
| Intersection LOS                | B     |       |       |       |       |       |      |      |      |      |      |      |
| Intersection V/C                | 0.400 |       |       |       |       |       |      |      |      |      |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 23: MD 410/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 58.7  
 Level Of Service: E  
 Volume to Capacity (v/c): 0.774

#### Intersection Setup

| Name                   | Belcrest Road                                                                     |        |        | Belcrest Rd                                                                       |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 250.00                                                                            | 100.00 | 100.00 | 250.00                                                                            | 100.00 | 100.00 | 225.00                                                                              | 100.00 | 100.00 | 225.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Road |        |        | Belcrest Rd |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|---------------|--------|--------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 232           | 270    | 11     | 95          | 409    | 93     | 112    | 684    | 122    | 194    | 1021   | 62     |
| Base Volume Adjustment Factor           | 1.0000        | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.21          | 2.00   | 3.85   | 2.00        | 2.21   | 2.63   | 2.00   | 2.00   | 2.38   | 2.63   | 2.00   | 2.63   |
| Growth Rate                             | 1.00          | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 18            | 0      | 0      | 40          | 0      | 3      | 17     | 44     | 75     | 32     | 37     | 0      |
| Diverted Trips [veh/h]                  | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 250           | 270    | 11     | 135         | 409    | 96     | 129    | 728    | 197    | 226    | 1058   | 62     |
| Peak Hour Factor                        | 0.9000        | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000        | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 69            | 75     | 3      | 38          | 114    | 27     | 36     | 202    | 55     | 63     | 294    | 17     |
| Total Analysis Volume [veh/h]           | 278           | 300    | 12     | 150         | 454    | 107    | 143    | 809    | 219    | 251    | 1176   | 69     |
| Presence of On-Street Parking           | No            |        | No     | No          |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0             | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 26            |        |        | 10          |        |        | 91     |        |        | 71     |        |        |
| Bicycle Volume [bicycles/h]             | 0             |        |        | 0           |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 144.0                           |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 4     | 4     | 4     | 3     | 3     | 3     | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |          |         |         |          |         |         |
| Lead / Lag                   | Lag   | -     | -     | Lag   | -     | -     | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 5     | 5     | 5     | 5     | 8        | 20      | 20      | 8        | 20      | 20      |
| Maximum Green [s]            | 21    | 21    | 21    | 33    | 33    | 33    | 21       | 50      | 50      | 21       | 50      | 50      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| Split [s]                    | 27    | 27    | 27    | 39    | 39    | 39    | 27       | 57      | 57      | 27       | 57      | 57      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       | No    |       |       | No    |       |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| Minimum Recall               |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    |       |       | No    |       | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 30.0  | 30.0  | 30.0  | 30.0  | 30.0     | 5.0     | 5.0     | 30.0     | 5.0     | 5.0     |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.50  | 6.50  | 6.00  | 6.50  | 6.50  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.50  | 4.50  | 4.00  | 4.50  | 4.50  |
| g_i, Effective Green Time [s]           | 20    | 20    | 20    | 30    | 30    | 30    | 14    | 54    | 54    | 21    | 61    | 61    |
| g / C, Green / Cycle                    | 0.13  | 0.13  | 0.13  | 0.20  | 0.20  | 0.20  | 0.09  | 0.36  | 0.36  | 0.14  | 0.41  | 0.41  |
| (v / s)_i Volume / Saturation Flow Rate | 0.11  | 0.11  | 0.11  | 0.08  | 0.19  | 0.15  | 0.08  | 0.23  | 0.14  | 0.14  | 0.33  | 0.04  |
| s, saturation flow rate [veh/h]         | 1770  | 1827  | 1652  | 1774  | 1859  | 1434  | 1774  | 3547  | 1544  | 1763  | 3547  | 1562  |
| c, Capacity [veh/h]                     | 232   | 239   | 216   | 361   | 378   | 291   | 168   | 1286  | 560   | 247   | 1447  | 637   |
| d1, Uniform Delay [s]                   | 63.82 | 63.78 | 63.89 | 52.01 | 58.55 | 55.95 | 66.84 | 39.47 | 35.50 | 64.49 | 39.33 | 27.51 |
| k, delay calibration                    | 0.20  | 0.19  | 0.20  | 0.11  | 0.31  | 0.19  | 0.11  | 0.50  | 0.50  | 0.39  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 14.95 | 14.11 | 16.83 | 0.77  | 21.26 | 6.13  | 11.30 | 2.34  | 2.05  | 54.63 | 5.10  | 0.34  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |        |        |        |        |        |        |       |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.86   | 0.85   | 0.87   | 0.42   | 0.92   | 0.73   | 0.85   | 0.63   | 0.39   | 1.02   | 0.81   | 0.11  |
| d, Delay for Lane Group [s/veh]       | 78.77  | 77.90  | 80.73  | 52.77  | 79.81  | 62.08  | 78.14  | 41.81  | 37.55  | 119.13 | 44.43  | 27.85 |
| Lane Group LOS                        | E      | E      | F      | D      | E      | E      | E      | D      | D      | F      | D      | C     |
| Critical Lane Group                   | No     | No     | Yes    | No     | Yes    | No     | Yes    | No     | No     | No     | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 8.42   | 8.60   | 8.04   | 5.04   | 15.18  | 8.11   | 5.84   | 12.46  | 6.19   | 13.01  | 19.57  | 1.58  |
| 50th-Percentile Queue Length [ft/ln]  | 210.57 | 214.97 | 201.05 | 126.11 | 379.51 | 202.71 | 146.06 | 311.60 | 154.64 | 325.21 | 489.21 | 39.56 |
| 95th-Percentile Queue Length [veh/ln] | 13.18  | 13.41  | 12.69  | 8.73   | 21.57  | 12.78  | 9.81   | 18.25  | 10.26  | 19.08  | 26.82  | 2.85  |
| 95th-Percentile Queue Length [ft/ln]  | 329.55 | 335.20 | 317.32 | 218.20 | 539.26 | 319.46 | 245.17 | 456.35 | 256.61 | 476.88 | 670.58 | 71.21 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |        |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 78.51 | 79.55 | 80.73 | 52.77 | 75.64 | 62.08 | 78.14 | 41.81 | 37.55 | 119.13 | 44.43 | 27.85 |
| Movement LOS                    | E     | E     | F     | D     | E     | E     | E     | D     | D     | F      | D     | C     |
| d_A, Approach Delay [s/veh]     | 79.09 |       |       | 68.78 |       |       | 45.45 |       |       | 56.20  |       |       |
| Approach LOS                    | E     |       |       | E     |       |       | D     |       |       | E      |       |       |
| d_I, Intersection Delay [s/veh] | 58.68 |       |       |       |       |       |       |       |       |        |       |       |
| Intersection LOS                | E     |       |       |       |       |       |       |       |       |        |       |       |
| Intersection V/C                | 0.774 |       |       |       |       |       |       |       |       |        |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 24: MD 410/MD 500/Adelphi Rd

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 110.7 |
| Analysis Method: | HCM 2010   | Level Of Service:         | F     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.058 |

#### Intersection Setup

| Name                   | Adelphi Rd                                                                        |        |        | MD 410                                                                            |        |        | MD 410                                                                              |        |        | MD 500                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Southbound                                                                        |        |        | Eastbound                                                                         |        |        | Westbound                                                                           |        |        | Northeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 350.00                                                                            | 100.00 | 150.00 | 300.00                                                                            | 100.00 | 100.00 | 350.00                                                                              | 100.00 | 150.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 45.00                                                                             |        |        | 50.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Adelphi Rd |        |        | MD 410 |        |        | MD 410 |        |        | MD 500 |        |        |
|-----------------------------------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 352        | 541    | 30     | 43     | 779    | 13     | 582    | 1233   | 526    | 8      | 591    | 381    |
| Base Volume Adjustment Factor           | 1.0000     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00       | 2.00   | 1.56   | 2.63   | 2.00   | 0.00   | 2.00   | 2.04   | 2.09   | 3.85   | 2.13   | 2.15   |
| Growth Rate                             | 1.00       | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0          | 3      | 2      | 0      | 84     | 0      | 10     | 21     | 0      | 8      | 12     | 35     |
| Diverted Trips [veh/h]                  | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 352        | 544    | 32     | 43     | 863    | 13     | 592    | 1254   | 526    | 16     | 603    | 416    |
| Peak Hour Factor                        | 0.9000     | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 98         | 151    | 9      | 12     | 240    | 4      | 164    | 348    | 146    | 4      | 168    | 116    |
| Total Analysis Volume [veh/h]           | 391        | 604    | 36     | 48     | 959    | 14     | 658    | 1393   | 584    | 18     | 670    | 462    |
| Presence of On-Street Parking           | No         |        | No     | No     |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 6          |        |        | 5      |        |        | 9      |        |        | 3      |        |        |
| Bicycle Volume [bicycles/h]             | 0          |        |        | 0      |        |        | 0      |        |        | 0      |        |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Protecte | Permiss | Unsigna | Protecte | Permiss | Overlap | Split | Split | Split |
|------------------------------|-------|-------|-------|----------|---------|---------|----------|---------|---------|-------|-------|-------|
| Signal group                 | 4     | 4     | 0     | 1        | 6       | 0       | 5        | 2       | 2       | 3     | 3     | 0     |
| Auxiliary Signal Groups      |       |       |       |          |         |         |          |         | 2,4     |       |       |       |
| Lead / Lag                   | Lag   | -     | -     | Lead     | -       | -       | Lead     | -       | -       | Lead  | -     | -     |
| Minimum Green [s]            | 7     | 7     | 0     | 5        | 25      | 0       | 5        | 5       | 5       | 7     | 7     | 0     |
| Maximum Green [s]            | 23    | 23    | 0     | 9        | 30      | 0       | 44       | 30      | 30      | 26    | 26    | 0     |
| Amber [s]                    | 5.0   | 5.0   | 0.0   | 4.0      | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     | 5.0   | 5.0   | 0.0   |
| All red [s]                  | 2.0   | 2.0   | 0.0   | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0   | 2.0   | 0.0   |
| Split [s]                    | 30    | 30    | 0     | 15       | 37      | 0       | 50       | 72      | 72      | 33    | 33    | 0     |
| Vehicle Extension [s]        | 2.5   | 2.5   | 0.0   | 3.0      | 5.0     | 0.0     | 6.0      | 3.0     | 3.0     | 2.5   | 2.5   | 0.0   |
| Walk [s]                     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 5       | 5       | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 10      | 10      | 0     | 0     | 0     |
| Rest In Walk                 |       | No    |       |          | No      |         |          | No      |         |       | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 0.0   | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0   | 2.0   | 0.0   |
| I2, Clearance Lost Time [s]  | 5.0   | 5.0   | 0.0   | 4.0      | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     | 5.0   | 5.0   | 0.0   |
| Minimum Recall               |       | No    |       | No       | No      |         | No       | No      | No      |       | No    |       |
| Maximum Recall               |       | No    |       | No       | Yes     |         | No       | No      | No      |       | No    |       |
| Pedestrian Recall            |       | No    |       | No       | No      |         | No       | No      | No      |       | No    |       |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0      | 294.0   | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 30.0     | 6.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L      | C      | C      | L     | C     | L     | C     | R    | C     | C     | R      |
|-----------------------------------------|--------|--------|--------|-------|-------|-------|-------|------|-------|-------|--------|
| C, Cycle Length [s]                     | 150    | 150    | 150    | 150   | 150   | 150   | 150   | 150  | 150   | 150   | 150    |
| L, Total Lost Time per Cycle [s]        | 7.00   | 7.00   | 7.00   | 7.00  | 7.00  | 7.00  | 7.00  | 7.00 | 7.00  | 7.00  | 7.00   |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00   | 0.00   | 0.00   | 2.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00   |
| l2, Clearance Lost Time [s]             | 5.00   | 5.00   | 5.00   | 0.00  | 5.00  | 0.00  | 5.00  | 0.00 | 5.00  | 5.00  | 5.00   |
| g_i, Effective Green Time [s]           | 23     | 23     | 23     | 80    | 53    | 80    | 65    | 110  | 26    | 26    | 26     |
| g / C, Green / Cycle                    | 0.15   | 0.15   | 0.15   | 0.53  | 0.36  | 0.53  | 0.43  | 0.73 | 0.17  | 0.17  | 0.17   |
| (v / s)_i Volume / Saturation Flow Rate | 0.19   | 0.19   | 0.20   | 0.13  | 0.27  | 0.36  | 0.39  | 0.37 | 0.19  | 0.19  | 0.30   |
| s, saturation flow rate [veh/h]         | 1774   | 1851   | 1660   | 384   | 3547  | 1848  | 3545  | 1578 | 1856  | 1693  | 1556   |
| c, Capacity [veh/h]                     | 272    | 284    | 255    | 96    | 1259  | 807   | 1536  | 1157 | 322   | 293   | 270    |
| d1, Uniform Delay [s]                   | 63.50  | 63.50  | 63.50  | 40.10 | 42.76 | 28.50 | 39.67 | 8.47 | 62.00 | 62.00 | 62.00  |
| k, delay calibration                    | 0.50   | 0.50   | 0.50   | 0.50  | 0.50  | 0.31  | 0.38  | 0.50 | 0.45  | 0.45  | 0.50   |
| l, Upstream Filtering Factor            | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00   |
| d2, Incremental Delay [s]               | 147.88 | 146.89 | 149.95 | 17.21 | 4.39  | 5.80  | 7.30  | 1.57 | 83.55 | 85.61 | 335.93 |
| d3, Initial Queue Delay [s]             | 0.00   | 0.00   | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00   |
| Rp, platoon ratio                       | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00   |
| PF, progression factor                  | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00   |

**Lane Group Results**

|                                       |        |        |        |       |        |        |        |        |        |        |         |
|---------------------------------------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|---------|
| X, volume / capacity                  | 1.27   | 1.27   | 1.27   | 0.50  | 0.76   | 0.82   | 0.91   | 0.50   | 1.12   | 1.12   | 1.71    |
| d, Delay for Lane Group [s/veh]       | 211.38 | 210.39 | 213.45 | 57.31 | 47.15  | 34.30  | 46.97  | 10.04  | 145.55 | 147.61 | 397.93  |
| Lane Group LOS                        | F      | F      | F      | E     | D      | C      | D      | B      | F      | F      | F       |
| Critical Lane Group                   | No     | No     | No     | Yes   | No     | No     | Yes    | Yes    | No     | No     | Yes     |
| 50th-Percentile Queue Length [veh/ln] | 21.36  | 22.21  | 20.14  | 1.55  | 16.07  | 7.01   | 24.30  | 7.29   | 19.48  | 17.94  | 35.25   |
| 50th-Percentile Queue Length [ft/ln]  | 534.06 | 555.34 | 503.52 | 38.80 | 401.76 | 175.36 | 607.39 | 182.27 | 487.02 | 448.49 | 881.30  |
| 95th-Percentile Queue Length [veh/ln] | 32.20  | 33.33  | 30.59  | 2.79  | 22.64  | 11.36  | 32.38  | 11.72  | 28.28  | 26.32  | 55.13   |
| 95th-Percentile Queue Length [ft/ln]  | 805.04 | 833.25 | 764.65 | 69.83 | 566.11 | 283.95 | 809.48 | 292.97 | 706.93 | 657.99 | 1378.35 |

**Movement, Approach, & Intersection Results**

|                                 |        |        |        |       |       |      |       |       |       |        |        |        |
|---------------------------------|--------|--------|--------|-------|-------|------|-------|-------|-------|--------|--------|--------|
| d_M, Delay for Movement [s/veh] | 211.25 | 211.85 | 213.45 | 57.31 | 47.15 | 0.00 | 34.30 | 46.97 | 10.04 | 145.55 | 146.56 | 397.93 |
| Movement LOS                    | F      | F      | F      | E     | D     |      | C     | D     | B     | F      | F      | F      |
| d_A, Approach Delay [s/veh]     | 211.68 |        |        | 47.63 |       |      | 35.62 |       |       | 247.53 |        |        |
| Approach LOS                    | F      |        |        | D     |       |      | D     |       |       | F      |        |        |
| d_I, Intersection Delay [s/veh] | 110.72 |        |        |       |       |      |       |       |       |        |        |        |
| Intersection LOS                | F      |        |        |       |       |      |       |       |       |        |        |        |
| Intersection V/C                | 1.058  |        |        |       |       |      |       |       |       |        |        |        |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 25: Ager Rd/23rd Ave

Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutes

Delay (sec / veh): 35.9  
Level Of Service: D  
Volume to Capacity (v/c): 0.579

#### Intersection Setup

| Name                   | Rittenhouse St                                                                    |        |        | 23rd Ave                                                                          |        |        | Ager Rd.                                                                            |        |        | Ager Rd.                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present           | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                        | Rittenhouse St |        |        | 23rd Ave |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|---------------------------------------------|----------------|--------|--------|----------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]                   | 14             | 18     | 22     | 267      | 13     | 75     | 19       | 875    | 164    | 11       | 465    | 3      |
| Base Volume Adjustment Factor               | 1.0000         | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00           | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   |
| Growth Rate                                 | 1.00           | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]                   | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 47     | 0      | 0        | 14     | 0      |
| Diverted Trips [veh/h]                      | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                        | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]            | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]                 | 14             | 18     | 22     | 267      | 13     | 75     | 19       | 922    | 164    | 11       | 479    | 3      |
| Peak Hour Factor                            | 1.0000         | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Other Adjustment Factor                     | 1.0000         | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 4              | 5      | 6      | 67       | 3      | 19     | 5        | 231    | 41     | 3        | 120    | 1      |
| Total Analysis Volume [veh/h]               | 14             | 18     | 22     | 267      | 13     | 75     | 19       | 922    | 164    | 11       | 479    | 3      |
| Presence of On-Street Parking               | No             |        | No     | No       |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0              | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]                 | 0              |        |        | 0        |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | Yes                             |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 0       | 8       | 0       | 0       | 4       | 0       | 0       | 2       | 0       | 0       | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       |
| Minimum Green [s]            | 0       | 6       | 0       | 0       | 6       | 0       | 0       | 35      | 0       | 0       | 35      | 0       |
| Maximum Green [s]            | 0       | 20      | 0       | 0       | 30      | 0       | 0       | 35      | 0       | 0       | 35      | 0       |
| Amber [s]                    | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 0       | 25      | 0       | 0       | 30      | 0       | 0       | 39      | 0       | 0       | 39      | 0       |
| Vehicle Extension [s]        | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 7       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 21      | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 2.00  | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 0.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 20    | 25    | 35    | 35    | 35    | 35    | 35    | 35    |
| g / C, Green / Cycle                    | 0.22  | 0.28  | 0.39  | 0.39  | 0.39  | 0.39  | 0.39  | 0.39  |
| (v / s)_i Volume / Saturation Flow Rate | 0.03  | 0.25  | 0.02  | 0.33  | 0.33  | 0.02  | 0.14  | 0.14  |
| s, saturation flow rate [veh/h]         | 1557  | 1392  | 822   | 1683  | 1596  | 467   | 1683  | 1679  |
| c, Capacity [veh/h]                     | 396   | 422   | 297   | 654   | 621   | 110   | 654   | 653   |
| d1, Uniform Delay [s]                   | 28.19 | 31.02 | 24.93 | 25.12 | 25.14 | 40.39 | 19.62 | 19.62 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.71  | 18.04 | 0.41  | 13.16 | 13.84 | 1.82  | 1.60  | 1.60  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |       |        |        |       |        |        |
|---------------------------------------|-------|--------|-------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.14  | 0.84   | 0.06  | 0.85   | 0.85   | 0.10  | 0.37   | 0.37   |
| d, Delay for Lane Group [s/veh]       | 28.91 | 49.06  | 25.34 | 38.29  | 38.98  | 42.21 | 21.21  | 21.22  |
| Lane Group LOS                        | C     | D      | C     | D      | D      | D     | C      | C      |
| Critical Lane Group                   | No    | Yes    | No    | No     | Yes    | No    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 1.00  | 9.08   | 0.33  | 12.53  | 12.01  | 0.28  | 3.72   | 3.71   |
| 50th-Percentile Queue Length [ft/ln]  | 25.12 | 226.98 | 8.28  | 313.20 | 300.22 | 7.10  | 92.90  | 92.77  |
| 95th-Percentile Queue Length [veh/ln] | 1.81  | 14.02  | 0.60  | 18.33  | 17.69  | 0.51  | 6.69   | 6.68   |
| 95th-Percentile Queue Length [ft/ln]  | 45.22 | 350.52 | 14.91 | 458.32 | 442.30 | 12.78 | 167.21 | 166.98 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 28.91 | 28.91 | 28.91 | 49.06 | 49.06 | 49.06 | 25.34 | 38.56 | 38.98 | 42.21 | 21.22 | 21.22 |
| Movement LOS                    | C     | C     | C     | D     | D     | D     | C     | D     | D     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 28.91 |       |       | 49.06 |       |       | 38.39 |       |       | 21.68 |       |       |
| Approach LOS                    | C     |       |       | D     |       |       | D     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 35.92 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.579 |       |       |       |       |       |       |       |       |       |       |       |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 34.0  |  |  | 34.0  |  |  | 20.0  |  |  | 11.0  |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 17.42 |  |  | 17.42 |  |  | 27.22 |  |  | 34.67 |  |  |
| I_p,int, Pedestrian LOS Score for Intersection           | 1.757 |  |  | 1.970 |  |  | 3.181 |  |  | 2.661 |  |  |
| Crosswalk LOS                                            | A     |  |  | A     |  |  | C     |  |  | B     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 444   |  |  | 556   |  |  | 778   |  |  | 778   |  |  |
| d_b, Bicycle Delay [s]                                   | 27.22 |  |  | 23.47 |  |  | 16.81 |  |  | 16.81 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 1.649 |  |  | 2.145 |  |  | 2.471 |  |  | 1.966 |  |  |
| Bicycle LOS                                              | A     |  |  | B     |  |  | B     |  |  | A     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 26: Ager Rd/Oglethorpe St/School

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 39.2  |
| Analysis Method: | HCM 6th Edition | Level Of Service:         | D     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.420 |

#### Intersection Setup

| Name                   | Oglethorpe St                                                                     |        |        | School                                                                            |        |        | Ager Rd.                                                                            |        |         | Ager Rd.                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|---------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |         | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |         |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right   | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00   | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1       | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 1200.00 | 350.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 35.00                                                                               |        |         | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |         | 0.00                                                                                |        |        |
| Curb Present           | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |         | No                                                                                  |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |         | Yes                                                                                 |        |        |

#### Volumes

| Name                                        | Oglethorpe St |        |        | School |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|---------------------------------------------|---------------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]                   | 27            | 12     | 36     | 14     | 0      | 4      | 25       | 936    | 80     | 122      | 718    | 12     |
| Base Volume Adjustment Factor               | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00          | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   |
| Growth Rate                                 | 1.00          | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]                   | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 47     | 0      | 0        | 14     | 0      |
| Diverted Trips [veh/h]                      | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                        | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]            | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]                 | 27            | 12     | 36     | 14     | 0      | 4      | 25       | 983    | 80     | 122      | 732    | 12     |
| Peak Hour Factor                            | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Other Adjustment Factor                     | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 7             | 3      | 9      | 4      | 0      | 1      | 6        | 246    | 20     | 31       | 183    | 3      |
| Total Analysis Volume [veh/h]               | 27            | 12     | 36     | 14     | 0      | 4      | 25       | 983    | 80     | 122      | 732    | 12     |
| Presence of On-Street Parking               | No            |        | No     | No     |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0             | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]                 | 0             |        |        | 0      |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | Yes                             |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 0       | 8       | 0       | 5        | 2       | 0       | 1        | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |          |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 0       | 5       | 0       | 5        | 10      | 0       | 5        | 10      | 0       |
| Maximum Green [s]            | 0       | 20      | 0       | 0       | 20      | 0       | 20       | 30      | 0       | 20       | 30      | 0       |
| Amber [s]                    | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 4.0      | 4.0     | 0.0     | 4.0      | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     |
| Split [s]                    | 0       | 30      | 0       | 0       | 30      | 0       | 30       | 45      | 0       | 30       | 45      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 6.0     | 0.0     | 3.0      | 6.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 27      | 0       | 0        | 11      | 0       | 0        | 12      | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | L    | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 109   | 109   | 109  | 109   | 109   | 109   | 109   | 109   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 2.00  | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 0.00 | 3.00  | 3.00  | 0.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 25    | 25    | 70   | 40    | 40    | 70    | 40    | 40    |
| g / C, Green / Cycle                    | 0.23  | 0.23  | 0.64 | 0.37  | 0.37  | 0.64  | 0.37  | 0.37  |
| (v / s)_i Volume / Saturation Flow Rate | 0.05  | 0.01  | 0.02 | 0.32  | 0.32  | 0.13  | 0.22  | 0.22  |
| s, saturation flow rate [veh/h]         | 1422  | 1272  | 1028 | 1683  | 1639  | 928   | 1683  | 1673  |
| c, Capacity [veh/h]                     | 371   | 350   | 639  | 618   | 601   | 549   | 618   | 614   |
| d1, Uniform Delay [s]                   | 34.02 | 32.75 | 8.93 | 32.11 | 32.12 | 14.02 | 28.06 | 28.06 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50 | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.22  | 0.28  | 0.11 | 15.61 | 15.98 | 0.93  | 4.34  | 4.36  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |       |      |        |        |       |        |        |
|---------------------------------------|-------|-------|------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.20  | 0.05  | 0.04 | 0.87   | 0.87   | 0.22  | 0.60   | 0.60   |
| d, Delay for Lane Group [s/veh]       | 35.24 | 33.02 | 9.05 | 47.72  | 48.10  | 14.95 | 32.40  | 32.42  |
| Lane Group LOS                        | D     | C     | A    | D      | D      | B     | C      | C      |
| Critical Lane Group                   | Yes   | No    | No   | No     | Yes    | Yes   | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 1.74  | 0.40  | 0.22 | 15.39  | 15.06  | 1.16  | 8.44   | 8.40   |
| 50th-Percentile Queue Length [ft/ln]  | 43.46 | 9.99  | 5.41 | 384.75 | 376.40 | 29.06 | 211.00 | 209.92 |
| 95th-Percentile Queue Length [veh/ln] | 3.13  | 0.72  | 0.39 | 21.82  | 21.42  | 2.09  | 13.20  | 13.15  |
| 95th-Percentile Queue Length [ft/ln]  | 78.22 | 17.98 | 9.74 | 545.60 | 535.49 | 52.30 | 330.11 | 328.73 |

**Movement, Approach, & Intersection Results**

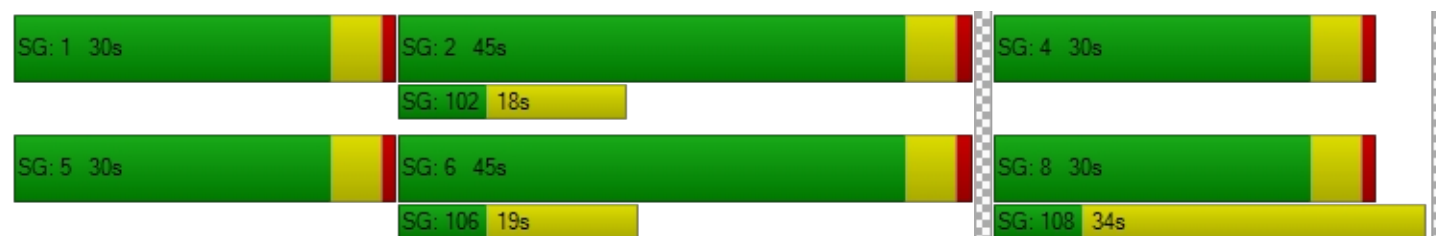
|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 35.24 | 35.24 | 35.24 | 33.02 | 33.02 | 33.02 | 9.05  | 47.89 | 48.10 | 14.95 | 32.41 | 32.42 |
| Movement LOS                    | D     | D     | D     | C     | C     | C     | A     | D     | D     | B     | C     | C     |
| d_A, Approach Delay [s/veh]     | 35.24 |       |       | 33.02 |       |       | 47.01 |       |       | 29.95 |       |       |
| Approach LOS                    | D     |       |       | C     |       |       | D     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 39.24 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.420 |       |       |       |       |       |       |       |       |       |       |       |

**Other Modes**

|                                                          |       |       |       |       |
|----------------------------------------------------------|-------|-------|-------|-------|
| g_Walk,mi, Effective Walk Time [s]                       | 11.0  | 11.0  | 25.0  | 11.0  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  | 0.00  | 0.00  | 0.00  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  | 0.00  | 0.00  | 0.00  |
| d_p, Pedestrian Delay [s]                                | 34.67 | 34.67 | 23.47 | 34.67 |
| I_p,int, Pedestrian LOS Score for Intersection           | 1.783 | 1.894 | 2.729 | 2.765 |
| Crosswalk LOS                                            | A     | A     | B     | C     |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  | 2000  | 2000  | 2000  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 556   | 556   | 889   | 889   |
| d_b, Bicycle Delay [s]                                   | 23.47 | 23.47 | 13.89 | 13.89 |
| I_b,int, Bicycle LOS Score for Intersection              | 1.683 | 1.589 | 2.457 | 2.274 |
| Bicycle LOS                                              | A     | A     | B     | B     |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 27: Ager Rd/Nicholson St

Control Type: Two-way stop  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 1,934.8  
 Level Of Service: F  
 Volume to Capacity (v/c): 4.241

#### Intersection Setup

| Name                   | Ager Rd.                                                                          |       |       |       | Nicholson St                                                                      |        |        | Nicholson St                                                                        |        |        | Ager Rd.                                                                            |       |       |       |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|
| Approach               | Northbound                                                                        |       |       |       | Northeastbound                                                                    |        |        | Southwestbound                                                                      |        |        | Southeastbound                                                                      |       |       |       |
| Lane Configuration     |  |       |       |       |  |        |        |  |        |        |  |       |       |       |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 1     | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 1                                                                                   | 0     | 0     | 0     |
| Pocket Length [ft]     | 225.0                                                                             | 100.0 | 100.0 | 150.0 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 200.0                                                                               | 100.0 | 100.0 | 100.0 |
| Speed [mph]            | 35.00                                                                             |       |       |       | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 35.00                                                                               |       |       |       |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |       |       |       |
| Crosswalk              | Yes                                                                               |       |       |       | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |       |       |       |

#### Volumes

| Name                                    | Ager Rd. |       |       |       | Nicholson St |        |        | Nicholson St |        |        | Ager Rd. |       |       |       |
|-----------------------------------------|----------|-------|-------|-------|--------------|--------|--------|--------------|--------|--------|----------|-------|-------|-------|
| Base Volume Input [veh/h]               | 1        | 39    | 741   | 25    | 98           | 17     | 82     | 60           | 18     | 239    | 6        | 51    | 713   | 82    |
| Base Volume Adjustment Factor           | 1.000    | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000    | 1.000 | 1.000 | 1.000 |
| Heavy Vehicles Percentage [%]           | 0.00     | 0.00  | 2.00  | 0.00  | 2.00         | 0.00   | 1.82   | 0.00         | 0.00   | 1.74   | 0.00     | 2.44  | 2.00  | 3.57  |
| Growth Rate                             | 1.00     | 1.00  | 1.00  | 1.00  | 1.00         | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00     | 1.00  | 1.00  | 1.00  |
| In-Process Volume [veh/h]               | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Site-Generated Trips [veh/h]            | 0        | 0     | 47    | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 14    | 0     |
| Diverted Trips [veh/h]                  | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Pass-by Trips [veh/h]                   | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Existing Site Adjustment Volume [veh/h] | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Other Volume [veh/h]                    | 0        | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Total Hourly Volume [veh/h]             | 1        | 39    | 788   | 25    | 98           | 17     | 82     | 60           | 18     | 239    | 6        | 51    | 727   | 82    |
| Peak Hour Factor                        | 0.900    | 0.900 | 0.900 | 0.900 | 0.9000       | 0.9000 | 0.9000 | 0.9000       | 0.9000 | 0.9000 | 0.900    | 0.900 | 0.900 | 0.900 |
| Other Adjustment Factor                 | 1.000    | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000    | 1.000 | 1.000 | 1.000 |
| Total 15-Minute Volume [veh/h]          | 0        | 11    | 219   | 7     | 27           | 5      | 23     | 17           | 5      | 66     | 2        | 14    | 202   | 23    |
| Total Analysis Volume [veh/h]           | 1        | 43    | 876   | 28    | 109          | 19     | 91     | 67           | 20     | 266    | 7        | 57    | 808   | 91    |
| Pedestrian Volume [ped/h]               | 0        |       |       |       | 0            |        |        | 0            |        |        | 0        |       |       |       |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Stop | Stop | Free |
| Flared Lane                        |      | No   | No   |      |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      | No   | No   |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |        |       |      |      |         |         |         |        |        |        |       |       |      |      |
|---------------------------------------|--------|-------|------|------|---------|---------|---------|--------|--------|--------|-------|-------|------|------|
| V/C, Movement V/C Ratio               | 0.00   | 0.06  | 0.01 | 0.00 | 4.24    | 0.36    | 0.16    | 1.53   | 0.40   | 0.48   | 0.05  | 0.08  | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 19.76  | 10.03 | 0.00 | 0.00 | 1934.77 | 1863.70 | 1801.16 | 763.09 | 752.88 | 687.17 | 29.33 | 10.78 | 0.00 | 0.00 |
| Movement LOS                          | C      | B     | A    | A    | F       | F       | F       | F      | F      | F      | D     | B     | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.00   | 0.00  | 0.00 | 0.00 | 24.93   | 24.93   | 24.93   | 30.22  | 30.22  | 30.22  | 0.03  | 0.03  | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 0.10   | 0.10  | 0.00 | 0.00 | 623.21  | 623.21  | 623.21  | 755.58 | 755.58 | 755.58 | 0.87  | 0.87  | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 0.48   |       |      |      | 1873.09 |         |         | 705.30 |        |        | 0.85  |       |      |      |
| Approach LOS                          | A      |       |      |      | F       |         |         | F      |        |        | A     |       |      |      |
| d_I, Intersection Delay [s/veh]       | 265.99 |       |      |      |         |         |         |        |        |        |       |       |      |      |
| Intersection LOS                      | F      |       |      |      |         |         |         |        |        |        |       |       |      |      |

### Intersection Level Of Service Report

#### Intersection 28: Ager Rd/Hamilton St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 16.3  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.651

#### Intersection Setup

| Name                   | Hamilton St                                                                       |        |        | Hamilton St                                                                       |        |        | Ager Rd.                                                                            |        |        | Ager Rd.                                                                            |        |         |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|---------|
| Approach               | Eastbound                                                                         |        |        | Westbound                                                                         |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |         |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |         |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00   |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1       |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 1500.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |         |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |         |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |         |

#### Volumes

| Name                                    | Hamilton St |        |        | Hamilton St |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|-----------------------------------------|-------------|--------|--------|-------------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]               | 28          | 74     | 10     | 45          | 220    | 330    | 79       | 180    | 55     | 388      | 347    | 115    |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.33        | 1.72   | 0.00   | 3.85        | 2.08   | 1.91   | 2.06     | 1.84   | 3.33   | 2.21     | 2.00   | 2.63   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]            | 47          | 82     | 58     | 0           | 23     | 0      | 17       | 0      | 0      | 0        | 0      | 14     |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]             | 75          | 156    | 68     | 45          | 243    | 330    | 96       | 180    | 55     | 388      | 347    | 129    |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 21          | 43     | 19     | 13          | 68     | 92     | 27       | 50     | 15     | 108      | 96     | 36     |
| Total Analysis Volume [veh/h]           | 83          | 173    | 76     | 50          | 270    | 367    | 107      | 200    | 61     | 431      | 386    | 143    |
| Presence of On-Street Parking           | No          |        | No     | No          |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0           |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0           |        |        | 0        |        |        | 0        |        |        |



**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 80                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 0       | 8       | 0       | 0       | 2       | 0       | 1        | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |          |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | -       | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 10      | 0       | 5        | 10      | 0       |
| Maximum Green [s]            | 0       | 26      | 0       | 0       | 26      | 0       | 0       | 30      | 0       | 10       | 45      | 0       |
| Amber [s]                    | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     |
| Split [s]                    | 0       | 30      | 0       | 0       | 30      | 0       | 0       | 35      | 0       | 15       | 50      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 3.0     | 0.0     | 2.0      | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | Yes     |         | Yes      | Yes     |         |
| Maximum Recall               |         | No      |         |         | No      |         |         | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | C     | C     | R     | L     | C     | C     | L    | C    |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| C, Cycle Length [s]                     | 64    | 64    | 64    | 64    | 64    | 64    | 64    | 64    | 64   | 64   |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 5.00  | 5.00  | 5.00  | 5.00 | 5.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  | 0.00 | 0.00 |
| l2, Clearance Lost Time [s]             | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  | 3.00  | 3.00  | 3.00  | 0.00 | 3.00 |
| g_i, Effective Green Time [s]           | 18    | 18    | 18    | 18    | 18    | 23    | 23    | 23    | 37   | 37   |
| g / C, Green / Cycle                    | 0.27  | 0.27  | 0.27  | 0.27  | 0.27  | 0.37  | 0.37  | 0.37  | 0.59 | 0.59 |
| (v / s)_i Volume / Saturation Flow Rate | 0.15  | 0.13  | 0.12  | 0.12  | 0.23  | 0.12  | 0.07  | 0.07  | 0.33 | 0.30 |
| s, saturation flow rate [veh/h]         | 796   | 1599  | 1042  | 1694  | 1585  | 870   | 1866  | 1720  | 1322 | 1778 |
| c, Capacity [veh/h]                     | 314   | 439   | 365   | 465   | 435   | 253   | 684   | 631   | 888  | 1040 |
| d1, Uniform Delay [s]                   | 22.71 | 19.48 | 18.84 | 19.10 | 21.96 | 25.73 | 13.85 | 13.89 | 7.42 | 7.86 |
| k, delay calibration                    | 0.11  | 0.11  | 0.11  | 0.11  | 0.13  | 0.11  | 0.11  | 0.11  | 0.50 | 0.11 |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |
| d2, Incremental Delay [s]               | 0.75  | 0.83  | 0.54  | 0.61  | 5.45  | 1.13  | 0.14  | 0.16  | 1.89 | 0.39 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |

**Lane Group Results**

|                                       |       |        |       |        |        |       |       |       |        |        |
|---------------------------------------|-------|--------|-------|--------|--------|-------|-------|-------|--------|--------|
| X, volume / capacity                  | 0.38  | 0.49   | 0.34  | 0.42   | 0.84   | 0.42  | 0.20  | 0.20  | 0.49   | 0.51   |
| d, Delay for Lane Group [s/veh]       | 23.46 | 20.31  | 19.38 | 19.71  | 27.41  | 26.86 | 13.99 | 14.04 | 9.31   | 8.25   |
| Lane Group LOS                        | C     | C      | B     | B      | C      | C     | B     | B     | A      | A      |
| Critical Lane Group                   | No    | No     | No    | No     | Yes    | No    | No    | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 1.58  | 2.52   | 1.34  | 2.26   | 5.34   | 1.52  | 1.20  | 1.15  | 2.90   | 3.32   |
| 50th-Percentile Queue Length [ft/ln]  | 39.55 | 62.89  | 33.58 | 56.61  | 133.42 | 38.03 | 30.04 | 28.69 | 72.45  | 83.12  |
| 95th-Percentile Queue Length [veh/ln] | 2.85  | 4.53   | 2.42  | 4.08   | 9.13   | 2.74  | 2.16  | 2.07  | 5.22   | 5.98   |
| 95th-Percentile Queue Length [ft/ln]  | 71.20 | 113.21 | 60.45 | 101.90 | 228.13 | 68.45 | 54.08 | 51.64 | 130.42 | 149.61 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |      |      |      |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|
| d_M, Delay for Movement [s/veh] | 23.46 | 20.96 | 20.31 | 19.38 | 19.62 | 27.41 | 26.86 | 14.01 | 14.04 | 9.31 | 8.25 | 8.25 |
| Movement LOS                    | C     | C     | C     | B     | B     | C     | C     | B     | B     | A    | A    | A    |
| d_A, Approach Delay [s/veh]     | 21.43 |       |       | 23.77 |       |       | 17.75 |       |       | 8.73 |      |      |
| Approach LOS                    | C     |       |       | C     |       |       | B     |       |       | A    |      |      |
| d_I, Intersection Delay [s/veh] | 16.34 |       |       |       |       |       |       |       |       |      |      |      |
| Intersection LOS                | B     |       |       |       |       |       |       |       |       |      |      |      |
| Intersection V/C                | 0.651 |       |       |       |       |       |       |       |       |      |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 29: Toledo Rd/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 8.6  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.375

#### Intersection Setup

| Name                   | Belcrest Rd                                                                       |       |       |       | Belcrest Rd                                                                       |       |       |       | Toledo Rd                                                                           |        |        | Toledo Rd                                                                           |        |        |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |       |       |       | Southbound                                                                        |       |       |       | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |       |       |       |  |       |       |       |  |        |        |  |        |        |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | U-tu                                                                              | Left  | Thru  | Right | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 0     | 1                                                                                 | 0     | 0     | 0     | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 400.0                                                                             | 100.0 | 100.0 | 100.0 | 200.0                                                                             | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |       |       |       | 30.00                                                                             |       |       |       | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |       |       |       | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |       |       |       | No                                                                                |       |       |       | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Rd |       |       |       | Belcrest Rd |       |       |       | Toledo Rd |        |        | Toledo Rd |        |        |
|-----------------------------------------|-------------|-------|-------|-------|-------------|-------|-------|-------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h]               | 15          | 96    | 258   | 53    | 2           | 78    | 497   | 73    | 28        | 18     | 28     | 57        | 23     | 90     |
| Base Volume Adjustment Factor           | 1.000       | 1.000 | 1.000 | 1.000 | 1.000       | 1.000 | 1.000 | 1.000 | 1.0000    | 1.0000 | 1.0000 | 1.0000    | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00        | 3.03  | 1.83  | 1.37  | 0.00        | 2.00  | 2.02  | 0.00  | 0.00      | 2.86   | 0.00   | 2.86      | 3.45   | 2.13   |
| Growth Rate                             | 1.00        | 1.00  | 1.00  | 1.00  | 1.00        | 1.00  | 1.00  | 1.00  | 1.00      | 1.00   | 1.00   | 1.00      | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 0     | 18    | 0     | 0           | 0     | 3     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Total Hourly Volume [veh/h]             | 15          | 96    | 276   | 53    | 2           | 78    | 500   | 73    | 28        | 18     | 28     | 57        | 23     | 90     |
| Peak Hour Factor                        | 0.900       | 0.900 | 0.900 | 0.900 | 0.900       | 0.900 | 0.900 | 0.900 | 0.9000    | 0.9000 | 0.9000 | 0.9000    | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.000       | 1.000 | 1.000 | 1.000 | 1.000       | 1.000 | 1.000 | 1.000 | 1.0000    | 1.0000 | 1.0000 | 1.0000    | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4           | 27    | 77    | 15    | 1           | 22    | 139   | 20    | 8         | 5      | 8      | 16        | 6      | 25     |
| Total Analysis Volume [veh/h]           | 17          | 107   | 307   | 59    | 2           | 87    | 556   | 81    | 31        | 20     | 31     | 63        | 26     | 100    |
| Presence of On-Street Parking           | No          |       |       | No    | No          |       |       | No    | No        |        | No     | No        |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Pedestrian Volume [ped/h]               | 8           |       |       |       | 0           |       |       |       | 20        |        |        | 15        |        |        |
| Bicycle Volume [bicycles/h]             | 0           |       |       |       | 0           |       |       |       | 0         |        |        | 0         |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 80                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Permi | Permi | Permi | Permi | Permi | Permi | Permi | Permi | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 2     | 2     | 2     | 2     | 6     | 6     | 6     | 6     | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |         |         |         |         |         |         |
| Lead / Lag                   | Lag   | Lag   | -     | -     | Lag   | Lag   | -     | -     | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 4     | 4     | 4     | 4     | 4     | 4     | 4     | 4     | 4       | 4       | 4       | 4       | 4       | 4       |
| Maximum Green [s]            | 40    | 40    | 40    | 40    | 40    | 40    | 40    | 40    | 30      | 30      | 30      | 30      | 30      | 30      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 45    | 45    | 45    | 45    | 45    | 45    | 45    | 45    | 35      | 35      | 35      | 35      | 35      | 35      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7       | 7       | 7       | 7       | 7       | 7       |
| Pedestrian Clearance [s]     | 15    | 15    | 15    | 15    | 15    | 15    | 15    | 15    | 21      | 21      | 21      | 21      | 21      | 21      |
| Rest In Walk                 |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| Maximum Recall               |       |       | Yes   |       |       |       | Yes   |       |         | No      |         |         | No      |         |
| Pedestrian Recall            |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 30.0  | 30.0  | 0.0   | 0.0   | 0.0   | 0.0   | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | L    | C    | C    | L     | C     | R     | C     |
|-----------------------------------------|------|------|------|------|------|------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 61   | 61   | 61   | 61   | 61   | 61   | 61    | 61    | 61    | 61    |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 40   | 40   | 40   | 40   | 40   | 40   | 11    | 11    | 11    | 11    |
| g / C, Green / Cycle                    | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.18  | 0.18  | 0.18  | 0.18  |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.10 | 0.10 | 0.09 | 0.17 | 0.18 | 0.02  | 0.01  | 0.02  | 0.13  |
| s, saturation flow rate [veh/h]         | 780  | 1866 | 1756 | 1007 | 1862 | 1773 | 1285  | 1847  | 1593  | 1508  |
| c, Capacity [veh/h]                     | 551  | 1231 | 1158 | 711  | 1228 | 1169 | 145   | 324   | 280   | 344   |
| d1, Uniform Delay [s]                   | 7.15 | 3.91 | 3.92 | 5.64 | 4.26 | 4.27 | 29.79 | 20.84 | 21.02 | 23.53 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.94 | 0.26 | 0.28 | 0.36 | 0.53 | 0.56 | 0.72  | 0.08  | 0.17  | 1.37  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

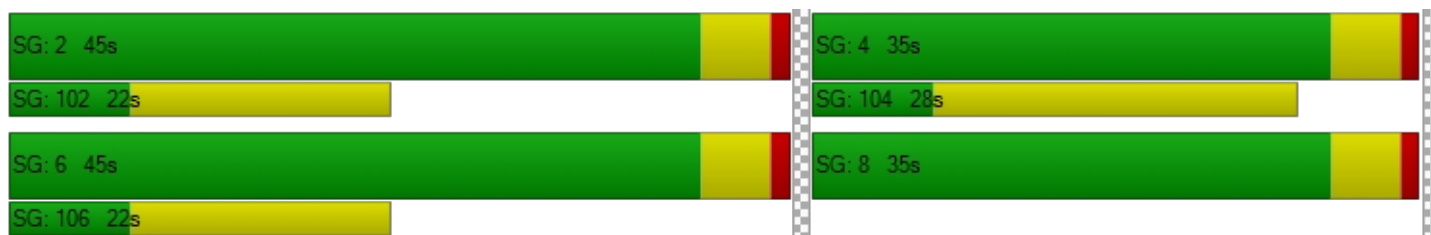
|                                       |       |       |       |       |       |       |       |       |       |        |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| X, volume / capacity                  | 0.22  | 0.15  | 0.15  | 0.13  | 0.26  | 0.27  | 0.21  | 0.06  | 0.11  | 0.55   |
| d, Delay for Lane Group [s/veh]       | 8.10  | 4.17  | 4.20  | 6.00  | 4.79  | 4.83  | 30.51 | 20.91 | 21.19 | 24.90  |
| Lane Group LOS                        | A     | A     | A     | A     | A     | A     | C     | C     | C     | C      |
| Critical Lane Group                   | No    | No    | No    | No    | No    | Yes   | No    | No    | No    | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 0.83  | 0.69  | 0.67  | 0.47  | 1.31  | 1.27  | 0.46  | 0.23  | 0.36  | 2.51   |
| 50th-Percentile Queue Length [ft/ln]  | 20.74 | 17.18 | 16.63 | 11.74 | 32.84 | 31.76 | 11.54 | 5.74  | 9.03  | 62.74  |
| 95th-Percentile Queue Length [veh/ln] | 1.49  | 1.24  | 1.20  | 0.85  | 2.36  | 2.29  | 0.83  | 0.41  | 0.65  | 4.52   |
| 95th-Percentile Queue Length [ft/ln]  | 37.32 | 30.93 | 29.93 | 21.13 | 59.11 | 57.16 | 20.78 | 10.33 | 16.26 | 112.94 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |      |      |      |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 8.10  | 8.10 | 4.18 | 4.20 | 6.00 | 6.00 | 4.80 | 4.83 | 30.51 | 20.91 | 21.19 | 24.90 | 24.90 | 24.90 |
| Movement LOS                    | A     | A    | A    | A    | A    | A    | A    | A    | C     | C     | C     | C     | C     | C     |
| d_A, Approach Delay [s/veh]     | 5.17  |      |      |      | 4.95 |      |      |      | 24.65 |       |       | 24.90 |       |       |
| Approach LOS                    | A     |      |      |      | A    |      |      |      | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 8.65  |      |      |      |      |      |      |      |       |       |       |       |       |       |
| Intersection LOS                | A     |      |      |      |      |      |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.375 |      |      |      |      |      |      |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 30: Adelphi Rd/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 23.7  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.783

#### Intersection Setup

| Name                   | Belcrest Rd                                                                       |        |        | Underwood St                                                                      |        |        | Adelphi Rd                                                                          |       |       |       | Adelphi Rd                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |       |       |       | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |       |       |       |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0     | 0     | 0     | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 150.0                                                                               | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |       |       |       | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |       |       |       | 0.00                                                                                |        |        |
| Crosswalk              | No                                                                                |        |        | Yes                                                                               |        |        | Yes                                                                                 |       |       |       | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Rd |        |        | Underwood St |        |        | Adelphi Rd |       |       |       | Adelphi Rd |        |        |
|-----------------------------------------|-------------|--------|--------|--------------|--------|--------|------------|-------|-------|-------|------------|--------|--------|
| Base Volume Input [veh/h]               | 376         | 0      | 31     | 18           | 42     | 6      | 2          | 37    | 1013  | 0     | 0          | 735    | 680    |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000      | 1.000 | 1.000 | 1.000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.12        | 0.00   | 0.00   | 0.00         | 0.00   | 0.00   | 0.00       | 0.00  | 1.98  | 0.00  | 0.00       | 1.99   | 1.94   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00       | 1.00  | 1.00  | 1.00  | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 18          | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 12    | 0     | 0          | 5      | 3      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 394         | 0      | 31     | 18           | 42     | 6      | 2          | 37    | 1025  | 0     | 0          | 740    | 683    |
| Peak Hour Factor                        | 0.9000      | 1.0000 | 1.0000 | 0.9000       | 0.9000 | 0.9000 | 0.900      | 0.900 | 0.900 | 1.000 | 1.0000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000      | 1.000 | 1.000 | 1.000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 109         | 0      | 8      | 5            | 12     | 2      | 1          | 10    | 285   | 0     | 0          | 206    | 190    |
| Total Analysis Volume [veh/h]           | 438         | 0      | 31     | 20           | 47     | 7      | 2          | 41    | 1139  | 0     | 0          | 822    | 759    |
| Presence of On-Street Parking           | No          |        | No     | No           |        | No     | No         |       |       | No    | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0            |        |        | 1          |       |       |       | 5          |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0            |        |        | 0          |       |       |       | 0          |        |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 120            |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 15.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 12.00          |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Permi | Prote | Permi | Permi | Permiss | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 4     | 0     | 0     | 8     | 8     | 8     | 5     | 5     | 2     | 0     | 0       | 6       | 6       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |       |       |         |         |         |
| Lead / Lag                   | Lead  | -     | -     | Lag   | -     | -     | Lead  | Lead  | -     | -     | -       | -       | -       |
| Minimum Green [s]            | 4     | 0     | 0     | 4     | 4     | 4     | 4     | 4     | 4     | 0     | 0       | 4       | 4       |
| Maximum Green [s]            | 30    | 0     | 0     | 16    | 16    | 16    | 11    | 11    | 60    | 0     | 0       | 45      | 45      |
| Amber [s]                    | 4.0   | 0.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.5   | 3.5   | 3.5   | 0.0   | 0.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 0.0   | 0.0   | 1.0   | 1.0   | 1.0   | 0.5   | 0.5   | 1.0   | 0.0   | 0.0     | 1.0     | 1.0     |
| Split [s]                    | 30    | 0     | 0     | 30    | 30    | 30    | 30    | 30    | 30    | 0     | 0       | 30      | 30      |
| Vehicle Extension [s]        | 3.0   | 0.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 3.0     |
| Walk [s]                     | 4     | 0     | 0     | 4     | 4     | 4     | 0     | 0     | 3     | 0     | 0       | 3       | 3       |
| Pedestrian Clearance [s]     | 13    | 0     | 0     | 13    | 13    | 13    | 0     | 0     | 8     | 0     | 0       | 8       | 8       |
| Rest In Walk                 | No    |       |       |       | No    |       |       |       | No    |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 0.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 0.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.5   | 0.0   | 0.0     | 3.0     | 3.0     |
| Minimum Recall               | No    |       |       |       | No    |       |       | No    | No    |       |         | No      |         |
| Maximum Recall               | No    |       |       |       | No    |       |       | No    | Yes   |       |         | Yes     |         |
| Pedestrian Recall            | No    |       |       |       | No    |       |       | No    | No    |       |         | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 30.0  | 30.0  | 30.0  | 0.0   | 0.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C    | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|------|-------|-------|
| C, Cycle Length [s]                     | 94    | 94    | 94    | 94    | 94   | 94    | 94    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 4.00  | 4.25  | 4.50 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 2.00  | 0.00  | 2.50 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 15    | 15    | 6     | 60    | 60   | 53    | 53    |
| g / C, Green / Cycle                    | 0.16  | 0.16  | 0.06  | 0.64  | 0.64 | 0.56  | 0.56  |
| (v / s)_i Volume / Saturation Flow Rate | 0.13  | 0.13  | 0.04  | 0.02  | 0.32 | 0.42  | 0.50  |
| s, saturation flow rate [veh/h]         | 1772  | 1781  | 1844  | 1810  | 3547 | 1863  | 1593  |
| c, Capacity [veh/h]                     | 285   | 287   | 113   | 453   | 2251 | 1039  | 889   |
| d1, Uniform Delay [s]                   | 38.33 | 38.33 | 43.38 | 19.23 | 9.30 | 16.05 | 18.34 |
| k, delay calibration                    | 0.11  | 0.11  | 0.11  | 0.50  | 0.50 | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 5.77  | 5.75  | 6.19  | 0.42  | 0.82 | 5.25  | 12.93 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |       |        |        |        |
|---------------------------------------|--------|--------|-------|-------|--------|--------|--------|
| X, volume / capacity                  | 0.82   | 0.82   | 0.65  | 0.10  | 0.51   | 0.76   | 0.89   |
| d, Delay for Lane Group [s/veh]       | 44.10  | 44.08  | 49.56 | 19.64 | 10.11  | 21.30  | 31.27  |
| Lane Group LOS                        | D      | D      | D     | B     | B      | C      | C      |
| Critical Lane Group                   | No     | Yes    | Yes   | Yes   | No     | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 5.61   | 5.64   | 1.87  | 0.35  | 5.86   | 13.45  | 16.83  |
| 50th-Percentile Queue Length [ft/ln]  | 140.36 | 141.04 | 46.79 | 8.67  | 146.55 | 336.28 | 420.83 |
| 95th-Percentile Queue Length [veh/ln] | 9.50   | 9.54   | 3.37  | 0.62  | 9.83   | 19.47  | 23.56  |
| 95th-Percentile Queue Length [ft/ln]  | 237.51 | 238.42 | 84.22 | 15.61 | 245.82 | 486.65 | 589.05 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |       |       |       |       |       |       |      |       |       |
|---------------------------------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 44.09 | 0.00 | 44.08 | 49.56 | 49.56 | 49.56 | 19.64 | 19.64 | 10.11 | 0.00  | 0.00 | 21.68 | 31.27 |
| Movement LOS                    | D     |      | D     | D     | D     | D     | B     | B     | B     |       |      | C     | C     |
| d_A, Approach Delay [s/veh]     | 44.09 |      |       | 49.56 |       |       | 10.46 |       |       | 26.29 |      |       |       |
| Approach LOS                    | D     |      |       | D     |       |       | B     |       |       | C     |      |       |       |
| d_I, Intersection Delay [s/veh] | 23.67 |      |       |       |       |       |       |       |       |       |      |       |       |
| Intersection LOS                | C     |      |       |       |       |       |       |       |       |       |      |       |       |
| Intersection V/C                | 0.783 |      |       |       |       |       |       |       |       |       |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | 8 | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 31: Adelphi Rd/Campus Dr

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 31.8  
Level Of Service: C  
Volume to Capacity (v/c): 0.473

#### Intersection Setup

| Name                   | Adelphi Rd.                                                                       |        |        | Adelphi Rd.                                                                       |        |        | Campus Dr.                                                                          |        |        | Campus Dr.                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 1      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 350.00                                                                            | 100.00 | 500.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 250.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 40.00                                                                             |        |        | 40.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Adelphi Rd. |        |        | Adelphi Rd. |        |        | Campus Dr. |        |        | Campus Dr. |        |        |
|-----------------------------------------|-------------|--------|--------|-------------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 230         | 953    | 80     | 209         | 1338   | 0      | 0          | 140    | 206    | 73         | 127    | 66     |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.27        | 2.08   | 2.27   | 2.00        | 2.05   | 0.00   | 0.00       | 2.00   | 2.21   | 2.00       | 2.00   | 2.00   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 30     | 0      | 0           | 8      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 230         | 983    | 80     | 209         | 1346   | 0      | 0          | 140    | 206    | 73         | 127    | 66     |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 1.0000 | 1.0000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 64          | 273    | 22     | 58          | 374    | 0      | 0          | 39     | 57     | 20         | 35     | 18     |
| Total Analysis Volume [veh/h]           | 256         | 1092   | 89     | 232         | 1496   | 0      | 0          | 156    | 229    | 81         | 141    | 73     |
| Presence of On-Street Parking           | No          |        | No     | No          |        | No     | No         |        | No     | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0           |        |        | 0          |        |        | 0          |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0           |        |        | 0          |        |        | 0          |        |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 248            |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 45.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 12.00          |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Overlap | Overlap | Permiss | Permiss | Permiss | Permiss | Split | Split | Split |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|-------|-------|-------|
| Signal group                 | 3        | 8       | 8       | 1       | 1       | 0       | 0       | 2       | 2       | 6     | 6     | 6     |
| Auxiliary Signal Groups      |          |         |         | 1,7     | 1,4     |         |         |         |         |       |       |       |
| Lead / Lag                   | Lag      | -       | -       | Lag     | -       | -       | -       | -       | -       | Lag   | -     | -     |
| Minimum Green [s]            | 5        | 8       | 8       | 15      | 15      | 0       | 0       | 25      | 25      | 5     | 5     | 5     |
| Maximum Green [s]            | 30       | 60      | 60      | 40      | 40      | 0       | 0       | 60      | 60      | 30    | 30    | 30    |
| Amber [s]                    | 4.0      | 4.0     | 4.0     | 4.0     | 4.0     | 0.0     | 0.0     | 4.5     | 4.5     | 4.5   | 4.5   | 4.5   |
| All red [s]                  | 1.0      | 2.0     | 2.0     | 1.0     | 1.0     | 0.0     | 0.0     | 1.5     | 1.5     | 1.5   | 1.5   | 1.5   |
| Split [s]                    | 30       | 30      | 30      | 30      | 30      | 0       | 0       | 30      | 30      | 30    | 30    | 30    |
| Vehicle Extension [s]        | 3.0      | 3.5     | 3.5     | 3.0     | 3.0     | 0.0     | 0.0     | 4.0     | 4.0     | 3.0   | 3.0   | 3.0   |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0     | 0     | 0     |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |       | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 0.0     | 0.0     | 2.0     | 2.0     | 2.0   | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0      | 4.0     | 4.0     | 3.0     | 3.0     | 0.0     | 0.0     | 4.0     | 4.0     | 4.0   | 4.0   | 4.0   |
| Minimum Recall               | Yes      | Yes     |         | Yes     | Yes     |         |         | Yes     |         |       | Yes   |       |
| Maximum Recall               | No       | No      |         | No      | No      |         |         | No      |         |       | No    |       |
| Pedestrian Recall            | No       | No      |         | No      | No      |         |         | No      |         |       | No    |       |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 30.0     | 30.0    | 30.0    | 30.0    | 30.0    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | C     | R     | C     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 118   | 118   | 118   | 118   | 118   | 118   | 118   | 118   | 118   | 118   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 6.00  | 6.00  | 5.00  | 5.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 4.00  | 4.00  | 0.00  | 0.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 19    | 34    | 34    | 57    | 73    | 25    | 25    | 10    | 10    | 10    |
| g / C, Green / Cycle                    | 0.16  | 0.28  | 0.28  | 0.49  | 0.62  | 0.21  | 0.21  | 0.09  | 0.09  | 0.09  |
| (v / s)_i Volume / Saturation Flow Rate | 0.14  | 0.22  | 0.06  | 0.07  | 0.42  | 0.04  | 0.14  | 0.06  | 0.06  | 0.05  |
| s, saturation flow rate [veh/h]         | 1769  | 5070  | 1579  | 3445  | 3545  | 3547  | 1580  | 1800  | 1695  | 1583  |
| c, Capacity [veh/h]                     | 291   | 1447  | 451   | 1672  | 2179  | 751   | 335   | 154   | 145   | 135   |
| d1, Uniform Delay [s]                   | 48.22 | 38.46 | 31.98 | 16.78 | 15.18 | 38.40 | 42.93 | 52.79 | 52.73 | 51.80 |
| k, delay calibration                    | 0.12  | 0.13  | 0.13  | 0.11  | 0.17  | 0.15  | 0.15  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 9.40  | 0.99  | 0.26  | 0.04  | 0.62  | 0.19  | 3.51  | 7.10  | 7.08  | 3.31  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |       |        |       |        |        |        |       |
|---------------------------------------|--------|--------|-------|-------|--------|-------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.88   | 0.75   | 0.20  | 0.14  | 0.69   | 0.21  | 0.68   | 0.75   | 0.74   | 0.54  |
| d, Delay for Lane Group [s/veh]       | 57.61  | 39.45  | 32.24 | 16.82 | 15.80  | 38.59 | 46.44  | 59.89  | 59.82  | 55.11 |
| Lane Group LOS                        | E      | D      | C     | B     | B      | D     | D      | E      | E      | E     |
| Critical Lane Group                   | Yes    | No     | No    | No    | Yes    | No    | Yes    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 7.96   | 9.46   | 1.93  | 1.69  | 12.20  | 1.87  | 6.41   | 3.61   | 3.35   | 2.18  |
| 50th-Percentile Queue Length [ft/ln]  | 199.07 | 236.50 | 48.21 | 42.25 | 304.89 | 46.85 | 160.29 | 90.31  | 83.69  | 54.53 |
| 95th-Percentile Queue Length [veh/ln] | 12.59  | 14.50  | 3.47  | 3.04  | 17.92  | 3.37  | 10.56  | 6.50   | 6.03   | 3.93  |
| 95th-Percentile Queue Length [ft/ln]  | 314.76 | 362.61 | 86.78 | 76.05 | 448.08 | 84.34 | 264.11 | 162.56 | 150.64 | 98.16 |

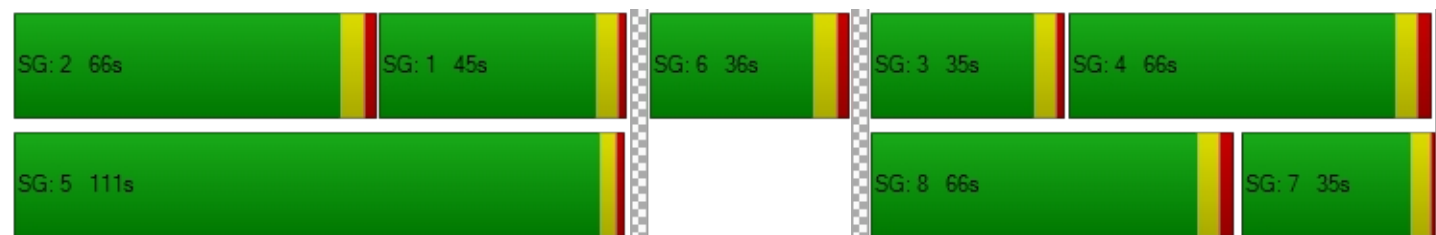


**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |      |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 57.61 | 39.45 | 32.24 | 16.82 | 15.80 | 0.00 | 0.00  | 38.59 | 46.44 | 59.89 | 59.84 | 55.11 |
| Movement LOS                    | E     | D     | C     | B     | B     |      |       | D     | D     | E     | E     | E     |
| d_A, Approach Delay [s/veh]     | 42.24 |       |       | 15.94 |       |      | 43.26 |       |       | 58.68 |       |       |
| Approach LOS                    | D     |       |       | B     |       |      | D     |       |       | E     |       |       |
| d_I, Intersection Delay [s/veh] | 31.78 |       |       |       |       |      |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |      |       |       |       |       |       |       |
| Intersection V/C                | 0.473 |       |       |       |       |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 6 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | - | - | 8 | 7 | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 32: Adelphi Rd/Toledo Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 6.3  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.424

#### Intersection Setup

| Name                   | Adelphi Rd                                                                        |        |        | Adelphi Rd                                                                         |        | Toledo Rd                                                                           |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |        |  |        |  |        |
| Turning Movement       | U-turn                                                                            | Left   | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 0                                                                                  | 1      | 0                                                                                   | 1      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 200.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 30.00                                                                              |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        |        | No                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Adelphi Rd |        |        | Adelphi Rd |        | Toledo Rd |        |
|-----------------------------------------|------------|--------|--------|------------|--------|-----------|--------|
| Base Volume Input [veh/h]               | 6          | 156    | 1022   | 667        | 104    | 51        | 75     |
| Base Volume Adjustment Factor           | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000    | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00       | 1.97   | 2.01   | 2.05       | 1.88   | 2.38      | 1.96   |
| Growth Rate                             | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00      | 1.00   |
| In-Process Volume [veh/h]               | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Site-Generated Trips [veh/h]            | 0          | 0      | 12     | 5          | 0      | 0         | 0      |
| Diverted Trips [veh/h]                  | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Pass-by Trips [veh/h]                   | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Existing Site Adjustment Volume [veh/h] | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Other Volume [veh/h]                    | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Right-Turn on Red Volume [veh/h]        | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Total Hourly Volume [veh/h]             | 6          | 156    | 1034   | 672        | 104    | 51        | 75     |
| Peak Hour Factor                        | 0.9000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000    | 0.9000 |
| Other Adjustment Factor                 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000    | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2          | 43     | 287    | 187        | 29     | 14        | 21     |
| Total Analysis Volume [veh/h]           | 7          | 173    | 1149   | 747        | 116    | 57        | 83     |
| Presence of On-Street Parking           | No         |        | No     | No         | No     | No        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Local Bus Stopping Rate [/h]            | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Pedestrian Volume [ped/h]               | 6          |        |        | 0          |        | 6         |        |
| Bicycle Volume [bicycles/h]             | 0          |        |        | 0          |        | 0         |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 100                          |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 9.00                         |

**Phasing & Timing**

| Control Type                 | Permissive | ProtectedP | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 5          | 5          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |            |       |       |
| Lead / Lag                   | Lead       | Lead       | -          | -          | -          | Lag   | -     |
| Minimum Green [s]            | 4          | 4          | 4          | 4          | 4          | 4     | 4     |
| Maximum Green [s]            | 15         | 15         | 65         | 45         | 45         | 25    | 25    |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 4.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 20         | 20         | 70         | 50         | 50         | 30    | 30    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 0          | 0          | 7          | 7          | 7          | 7     | 7     |
| Pedestrian Clearance [s]     | 0          | 0          | 6          | 6          | 6          | 13    | 13    |
| Rest In Walk                 |            |            | No         | No         |            | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Minimum Recall               |            | No         | No         | No         |            | No    |       |
| Maximum Recall               |            | No         | Yes        | Yes        |            | No    |       |
| Pedestrian Recall            |            | No         | No         | No         |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 30.0       | 30.0       | 30.0       | 30.0       | 30.0       | 30.0  | 30.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | R    | L     | R     |
|-----------------------------------------|------|------|------|------|-------|-------|
| C, Cycle Length [s]                     | 82   | 82   | 82   | 82   | 82    | 82    |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00 | 3.00 | 3.00 | 3.00 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 65   | 65   | 56   | 56   | 7     | 7     |
| g / C, Green / Cycle                    | 0.79 | 0.79 | 0.68 | 0.68 | 0.09  | 0.09  |
| (v / s)_i Volume / Saturation Flow Rate | 0.22 | 0.32 | 0.21 | 0.07 | 0.03  | 0.05  |
| s, saturation flow rate [veh/h]         | 834  | 3546 | 3545 | 1578 | 1767  | 1552  |
| c, Capacity [veh/h]                     | 718  | 2796 | 2390 | 1064 | 159   | 140   |
| d1, Uniform Delay [s]                   | 2.58 | 2.73 | 5.55 | 4.73 | 35.26 | 36.05 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.84 | 0.45 | 0.34 | 0.21 | 1.35  | 3.96  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |       |        |       |       |       |
|---------------------------------------|-------|-------|--------|-------|-------|-------|
| X, volume / capacity                  | 0.25  | 0.41  | 0.31   | 0.11  | 0.36  | 0.59  |
| d, Delay for Lane Group [s/veh]       | 3.41  | 3.17  | 5.89   | 4.93  | 36.61 | 40.01 |
| Lane Group LOS                        | A     | A     | A      | A     | D     | D     |
| Critical Lane Group                   | No    | Yes   | No     | No    | No    | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 0.42  | 1.24  | 2.26   | 0.63  | 1.12  | 1.73  |
| 50th-Percentile Queue Length [ft/ln]  | 10.46 | 31.04 | 56.47  | 15.72 | 27.93 | 43.20 |
| 95th-Percentile Queue Length [veh/ln] | 0.75  | 2.24  | 4.07   | 1.13  | 2.01  | 3.11  |
| 95th-Percentile Queue Length [ft/ln]  | 18.83 | 55.88 | 101.65 | 28.29 | 50.27 | 77.76 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |      |       |       |
|---------------------------------|-------|------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 3.41  | 3.41 | 3.17 | 5.89 | 4.93 | 36.61 | 40.01 |
| Movement LOS                    | A     | A    | A    | A    | A    | D     | D     |
| d_A, Approach Delay [s/veh]     | 3.21  |      |      | 5.76 |      | 38.63 |       |
| Approach LOS                    | A     |      |      | A    |      | D     |       |
| d_I, Intersection Delay [s/veh] | 6.28  |      |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |      |       |       |
| Intersection V/C                | 0.424 |      |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 33: Hamilton St/40th Pl/39th Ave

Control Type: All-way stop  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 15.7  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.658

#### Intersection Setup

| Name                   | Magruder Park Ent |        |        |        | 39th Ave   |        |        |        | Hamilton St |        |        |        |
|------------------------|-------------------|--------|--------|--------|------------|--------|--------|--------|-------------|--------|--------|--------|
| Approach               | Northbound        |        |        |        | Southbound |        |        |        | Eastbound   |        |        |        |
| Lane Configuration     |                   |        |        |        |            |        |        |        |             |        |        |        |
| Turning Movement       | Left              | Thru   | Right  | Right2 | Left2      | Left   | Thru   | Right  | Left2       | Left   | Thru   | Right  |
| Lane Width [ft]        | 12.00             | 12.00  | 12.00  | 12.00  | 12.00      | 12.00  | 12.00  | 12.00  | 12.00       | 12.00  | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                 | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pocket Length [ft]     | 100.00            | 100.00 | 100.00 | 100.00 | 100.00     | 100.00 | 100.00 | 100.00 | 100.00      | 100.00 | 100.00 | 100.00 |
| Speed [mph]            | 30.00             |        |        |        | 30.00      |        |        |        | 35.00       |        |        |        |
| Grade [%]              | 0.00              |        |        |        | 0.00       |        |        |        | 0.00        |        |        |        |
| Crosswalk              | Yes               |        |        |        | Yes        |        |        |        | Yes         |        |        |        |

#### Volumes

| Name                                    | Magruder Park Ent |        |        |        | 39th Ave |        |        |        | Hamilton St |        |        |        |
|-----------------------------------------|-------------------|--------|--------|--------|----------|--------|--------|--------|-------------|--------|--------|--------|
| Base Volume Input [veh/h]               | 4                 | 1      | 0      | 2      | 0        | 6      | 2      | 29     | 62          | 0      | 335    | 8      |
| Base Volume Adjustment Factor           | 1.0000            | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00              | 0.00   | 0.00   | 0.00   | 0.00     | 0.00   | 0.00   | 0.00   | 3.85        | 0.00   | 2.15   | 0.00   |
| Growth Rate                             | 1.00              | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 12     | 0      |
| Diverted Trips [veh/h]                  | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 4                 | 1      | 0      | 2      | 0        | 6      | 2      | 29     | 62          | 0      | 347    | 8      |
| Peak Hour Factor                        | 0.9000            | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000            | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1                 | 0      | 0      | 1      | 0        | 2      | 1      | 8      | 17          | 0      | 96     | 2      |
| Total Analysis Volume [veh/h]           | 4                 | 1      | 0      | 2      | 0        | 7      | 2      | 32     | 69          | 0      | 386    | 9      |
| Pedestrian Volume [ped/h]               | 0                 |        |        |        | 0        |        |        |        | 0           |        |        |        |

**Intersection Settings****Lanes**

|                                 |      |      |      |
|---------------------------------|------|------|------|
| Capacity per Entry Lane [veh/h] | 576  | 623  | 705  |
| Degree of Utilization, x        | 0.01 | 0.07 | 0.66 |

**Movement, Approach, & Intersection Results**

|                                    |       |      |        |
|------------------------------------|-------|------|--------|
| 95th-Percentile Queue Length [veh] | 0.04  | 0.21 | 4.96   |
| 95th-Percentile Queue Length [ft]  | 0.92  | 5.27 | 124.00 |
| Approach Delay [s/veh]             | 9.33  | 9.18 | 17.38  |
| Approach LOS                       | A     | A    | C      |
| Intersection Delay [s/veh]         | 15.66 |      |        |
| Intersection LOS                   | C     |      |        |



**Intersection Setup**

| Name                   | Hamilton St                                                                       |        |        |        | Gallatin St                                                                         |        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|--------|
| Approach               | Westbound                                                                         |        |        |        | Northwestbound                                                                      |        |        |        |
| Lane Configuration     |  |        |        |        |  |        |        |        |
| Turning Movement       | Left2                                                                             | Left   | Thru   | Right  | Left                                                                                | Thru   | Right  | Right2 |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0      | 0                                                                                   | 0      | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        |        | 35.00                                                                               |        |        |        |
| Grade [%]              | 0.00                                                                              |        |        |        | 0.00                                                                                |        |        |        |
| Crosswalk              | Yes                                                                               |        |        |        | Yes                                                                                 |        |        |        |

**Volumes**

| Name                                    | Hamilton St |        |        |        | Gallatin St |        |        |        |
|-----------------------------------------|-------------|--------|--------|--------|-------------|--------|--------|--------|
| Base Volume Input [veh/h]               | 6           | 6      | 112    | 2      | 12          | 375    | 2      | 0      |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00        | 0.00   | 2.20   | 0.00   | 0.00        | 2.18   | 0.00   | 0.00   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 0      | 0      | 0      | 0           | 3      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 6           | 6      | 112    | 2      | 12          | 378    | 2      | 0      |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2           | 2      | 31     | 1      | 3           | 105    | 1      | 0      |
| Total Analysis Volume [veh/h]           | 7           | 7      | 124    | 2      | 13          | 420    | 2      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        |        | 0           |        |        |        |

**Intersection Settings**

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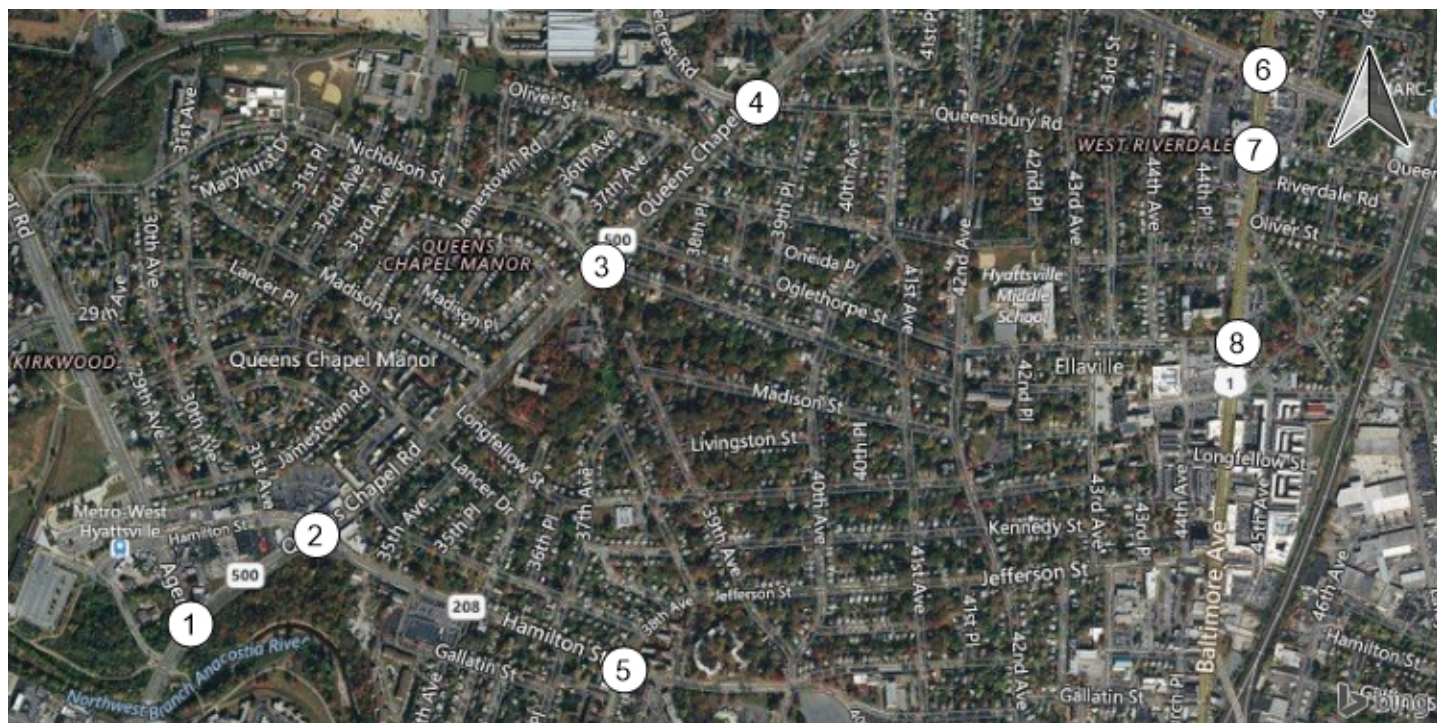
**Lanes**

|                                 |      |      |
|---------------------------------|------|------|
| Capacity per Entry Lane [veh/h] | 600  | 702  |
| Degree of Utilization, x        | 0.23 | 0.62 |

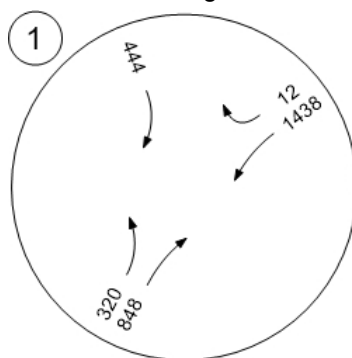
**Movement, Approach, & Intersection Results**

|                                    |       |        |
|------------------------------------|-------|--------|
| 95th-Percentile Queue Length [veh] | 0.90  | 4.32   |
| 95th-Percentile Queue Length [ft]  | 22.46 | 108.04 |
| Approach Delay [s/veh]             | 10.81 | 16.09  |
| Approach LOS                       | B     | C      |
| Intersection Delay [s/veh]         | 15.66 |        |
| Intersection LOS                   | C     |        |

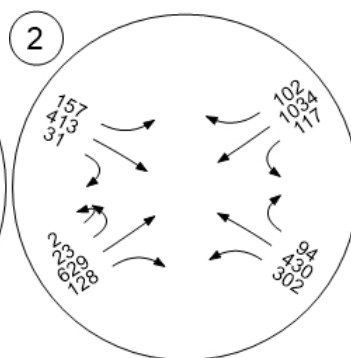
## Traffic Volume - Future Total Volume



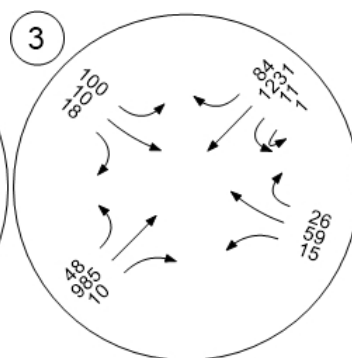
MD 500/Ager Rd



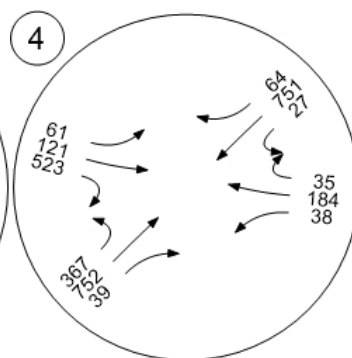
MD 500/Hamilton St



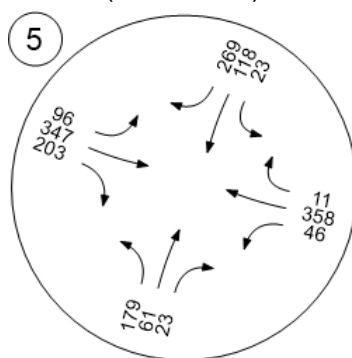
MD 500/Nicholson St



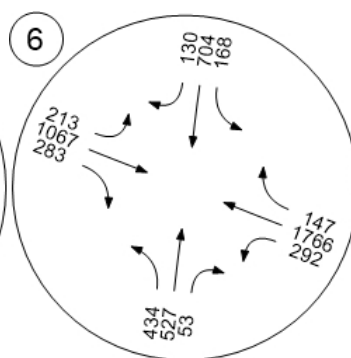
MD 500/Belcrest Rd/Queens



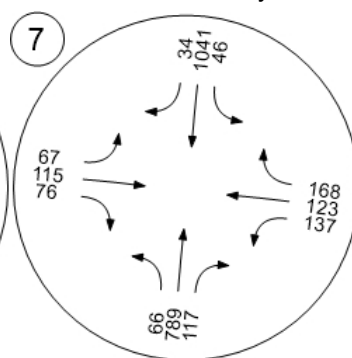
MD 208(Hamilton St)/38th Av



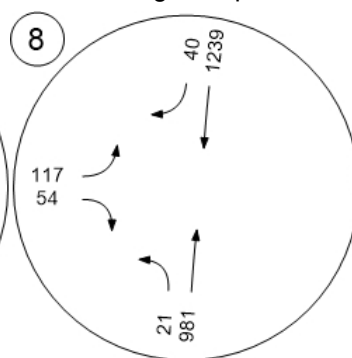
US 1/MD 410



US 1/Queensbury Rd

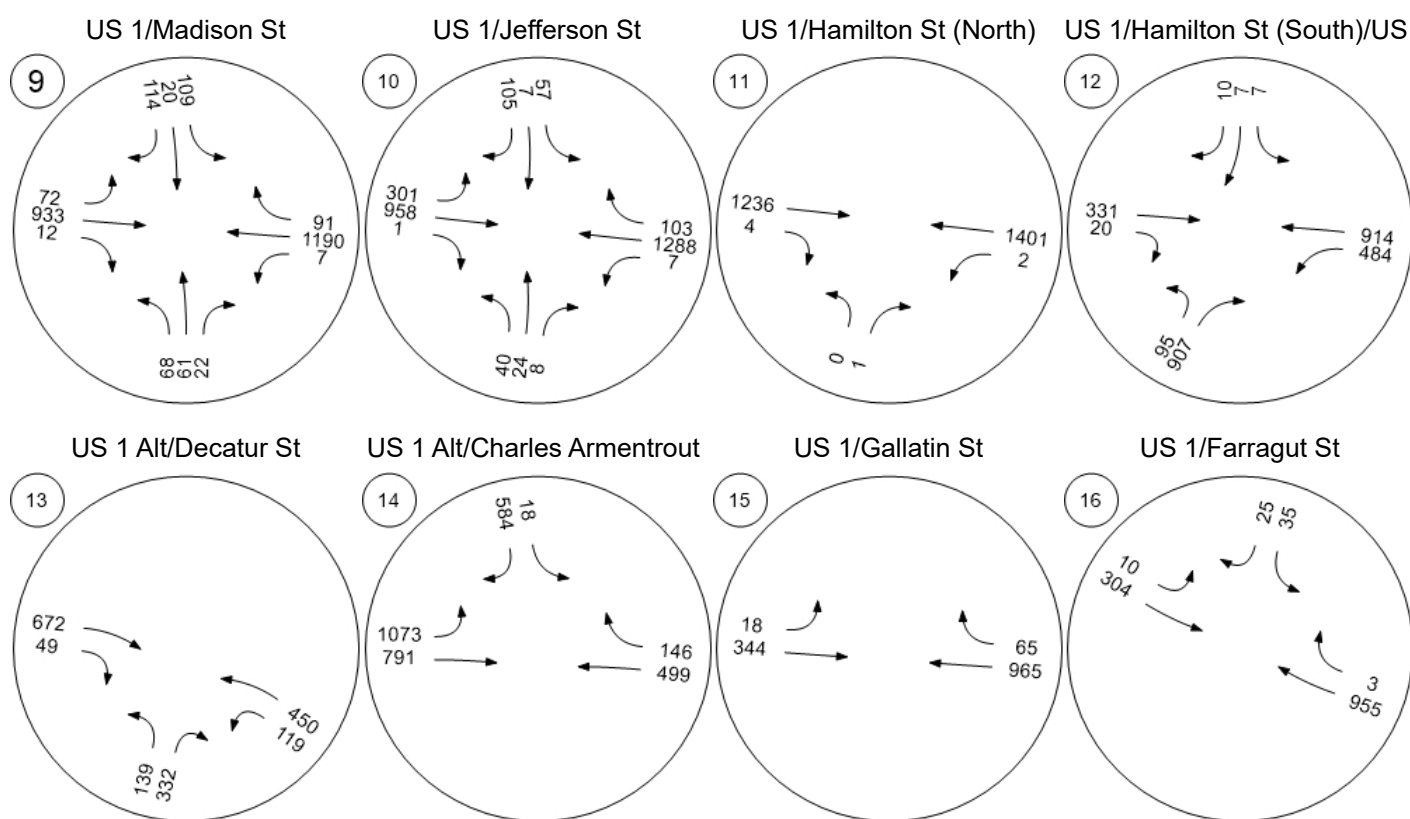


US 1/Oglethorpe Rd



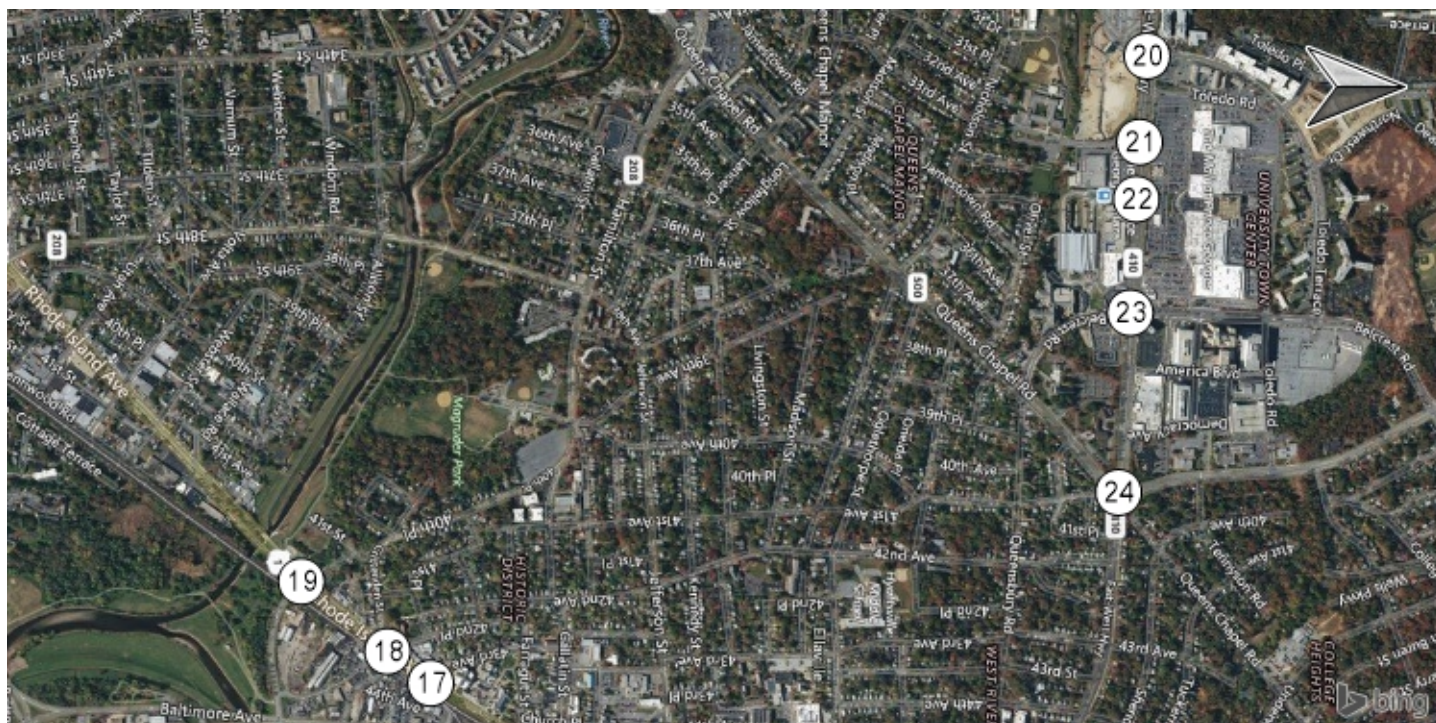


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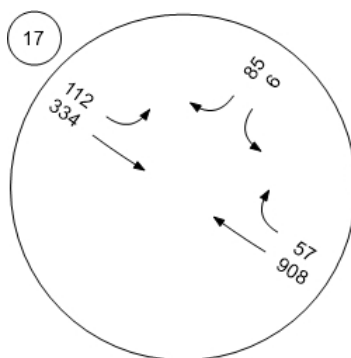




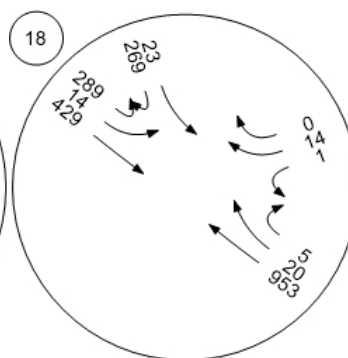
## Traffic Volume - Future Total Volume



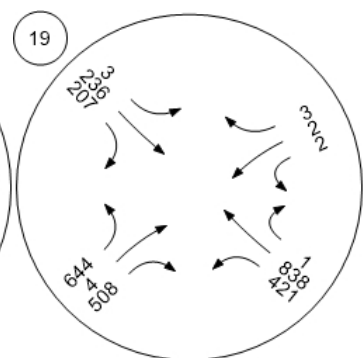
US 1/43rd Avenue



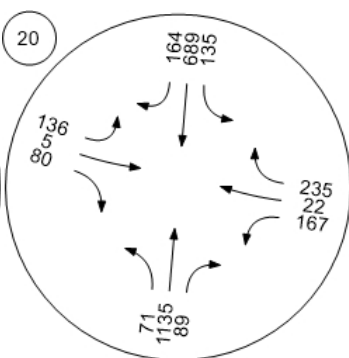
US 1/42nd Place/Crittendon



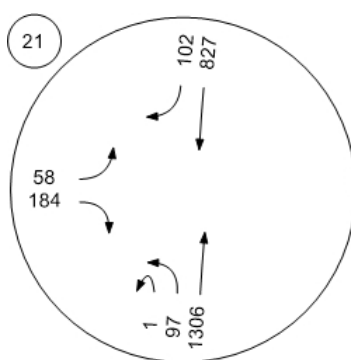
US 1/41st Place/Charles Arm



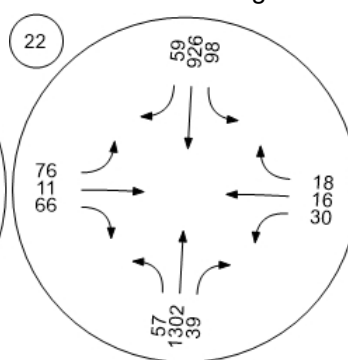
MD 410/Toledo Terrace



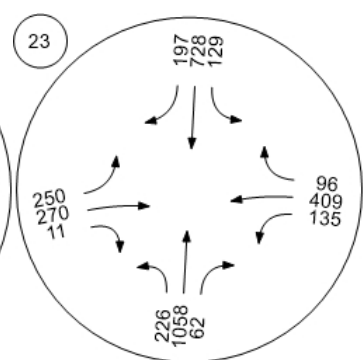
MD 410/Editors Park Dr



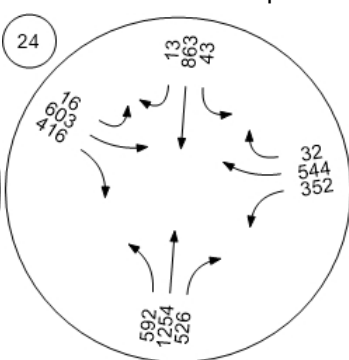
MD 410/Prince George's Plaz



MD 410/Belcrest Rd

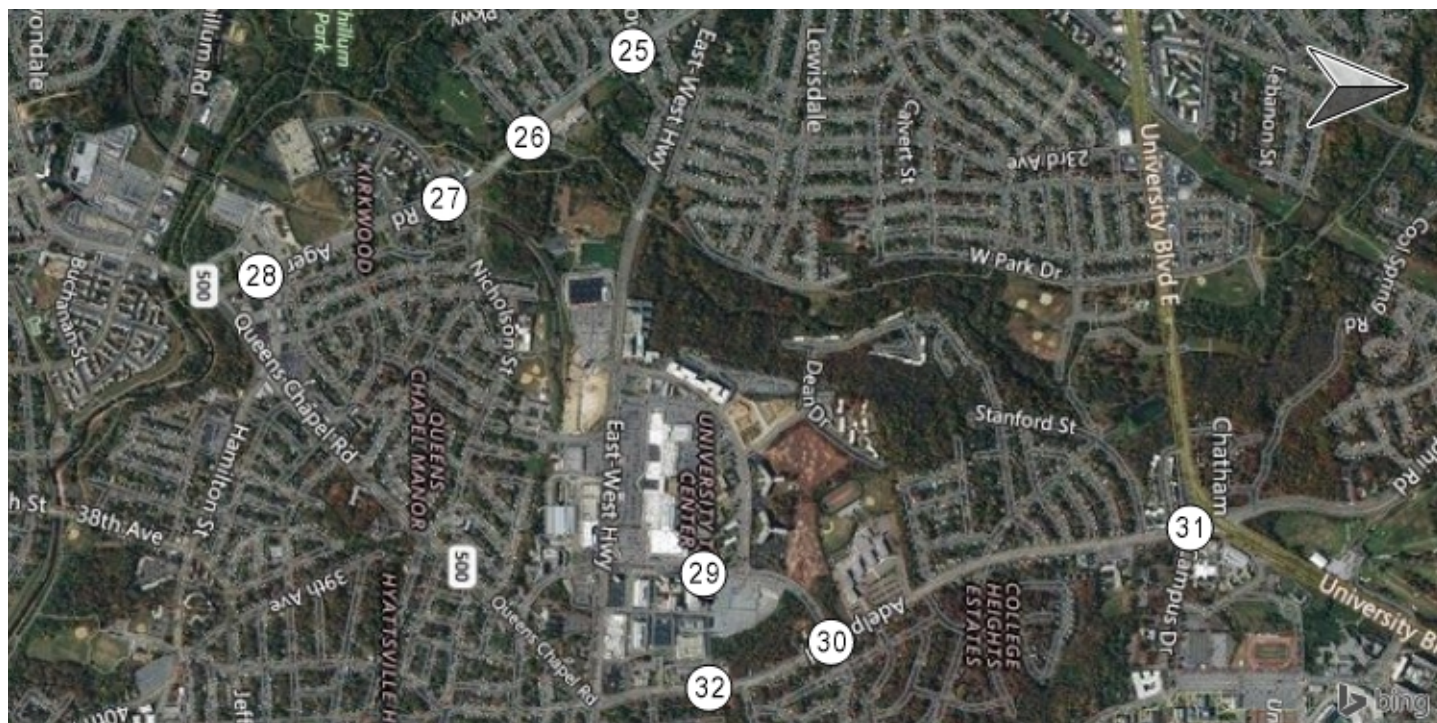


MD 410/MD 500/Adelphi Rd

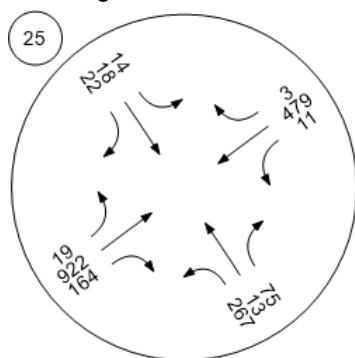




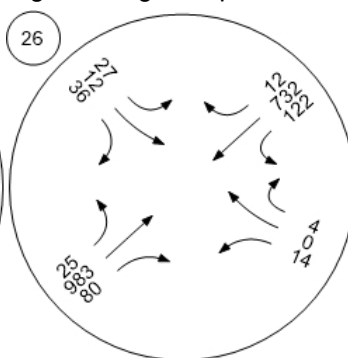
## Traffic Volume - Future Total Volume



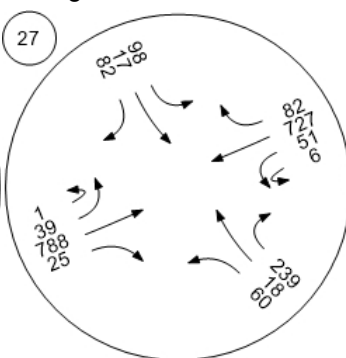
Ager Rd/23rd Ave



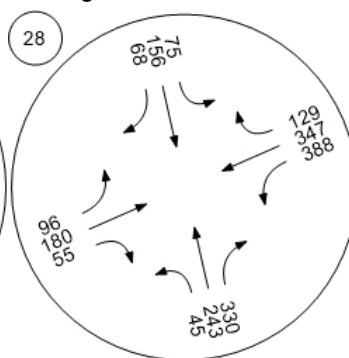
Ager Rd/Oglethorpe St/Scho



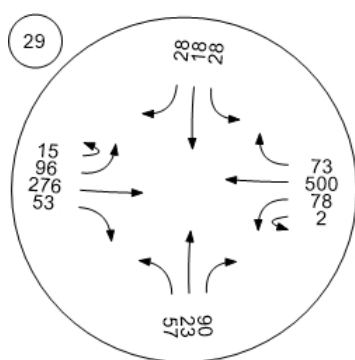
Ager Rd/Nicholson St



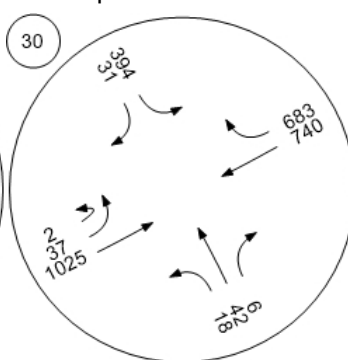
Ager Rd/Hamilton St



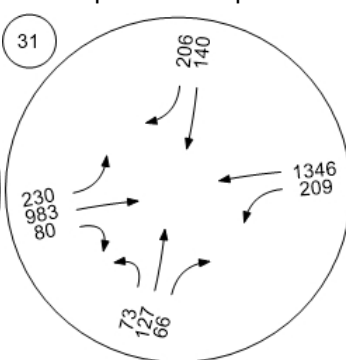
Toledo Rd/Belcrest Rd



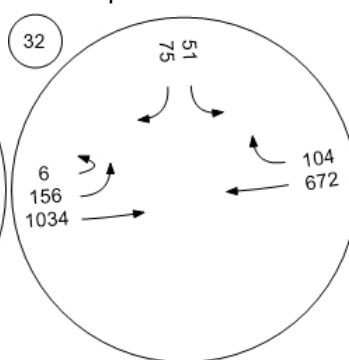
Adelphi Rd/Belcrest Rd



Adelphi Rd/Campus Dr



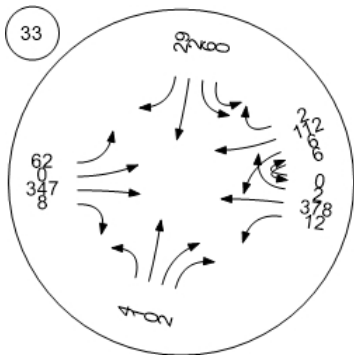
Adelphi Rd/Toledo Rd



Traffic Volume - Future Total Volume

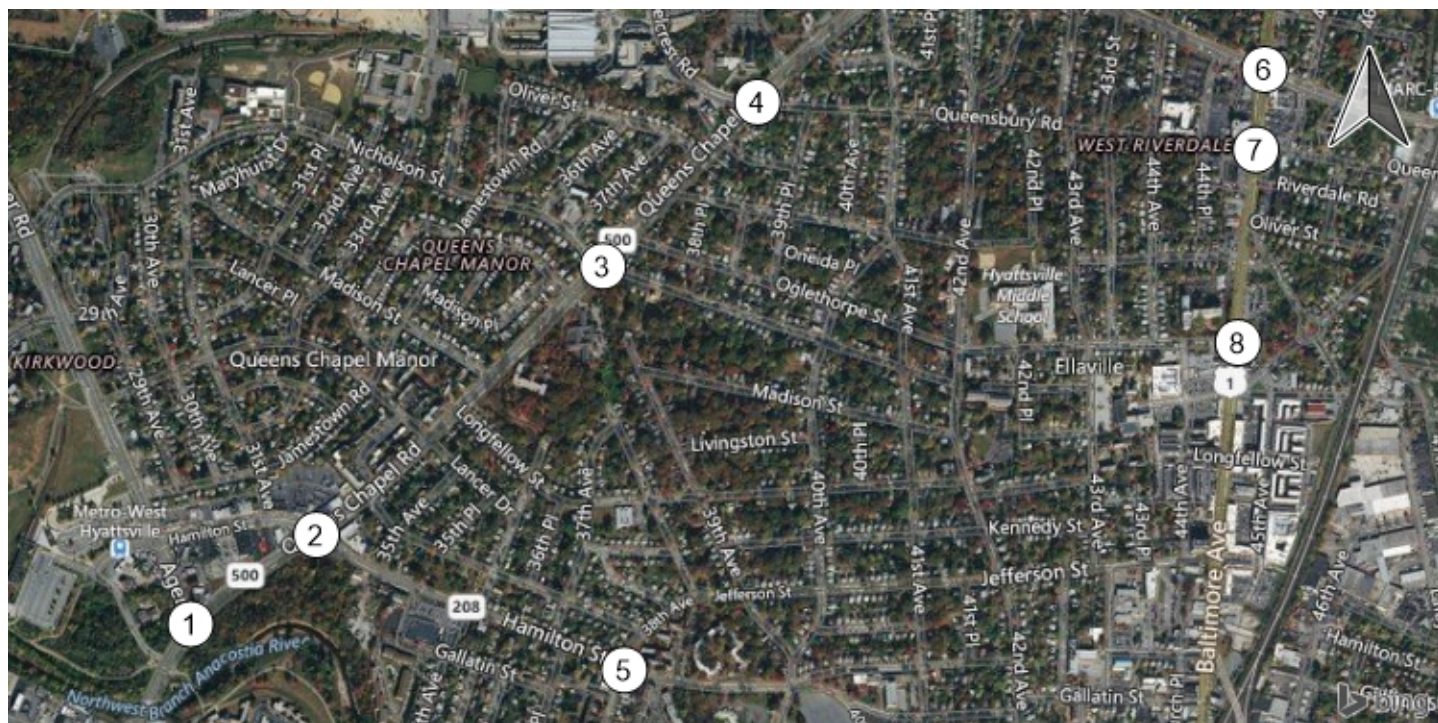


Hamilton St/40th Pl/39th Ave

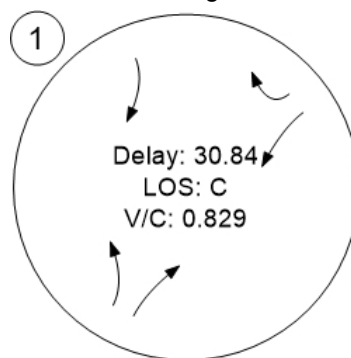




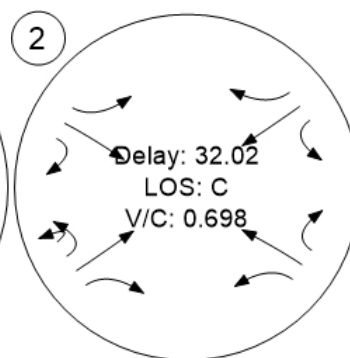
## Traffic Conditions



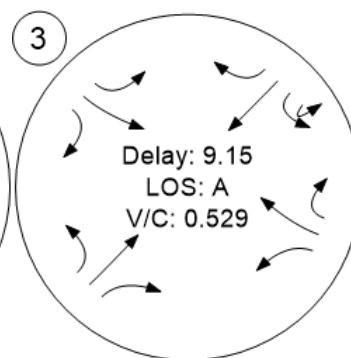
MD 500/Ager Rd



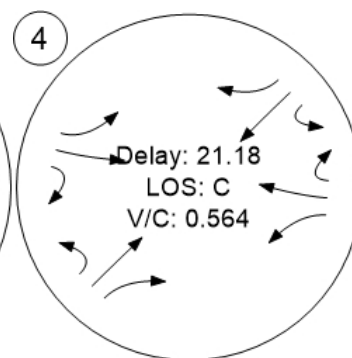
MD 500/Hamilton St



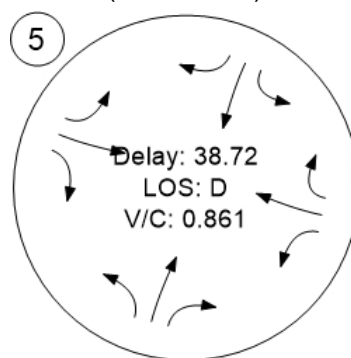
MD 500/Nicholson St



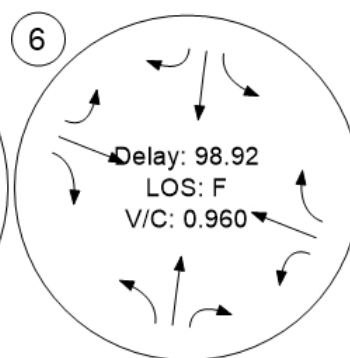
MD 500/Belcrest Rd/Queens



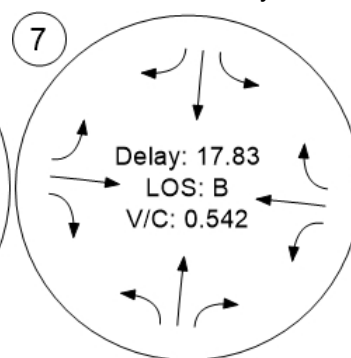
MD 208(Hamilton St)/38th Av



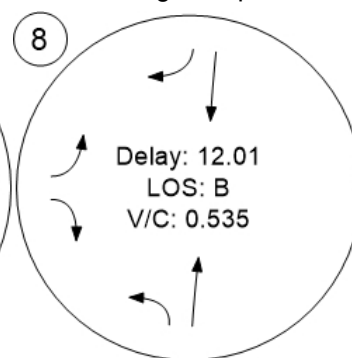
US 1/MD 410



US 1/Queensbury Rd

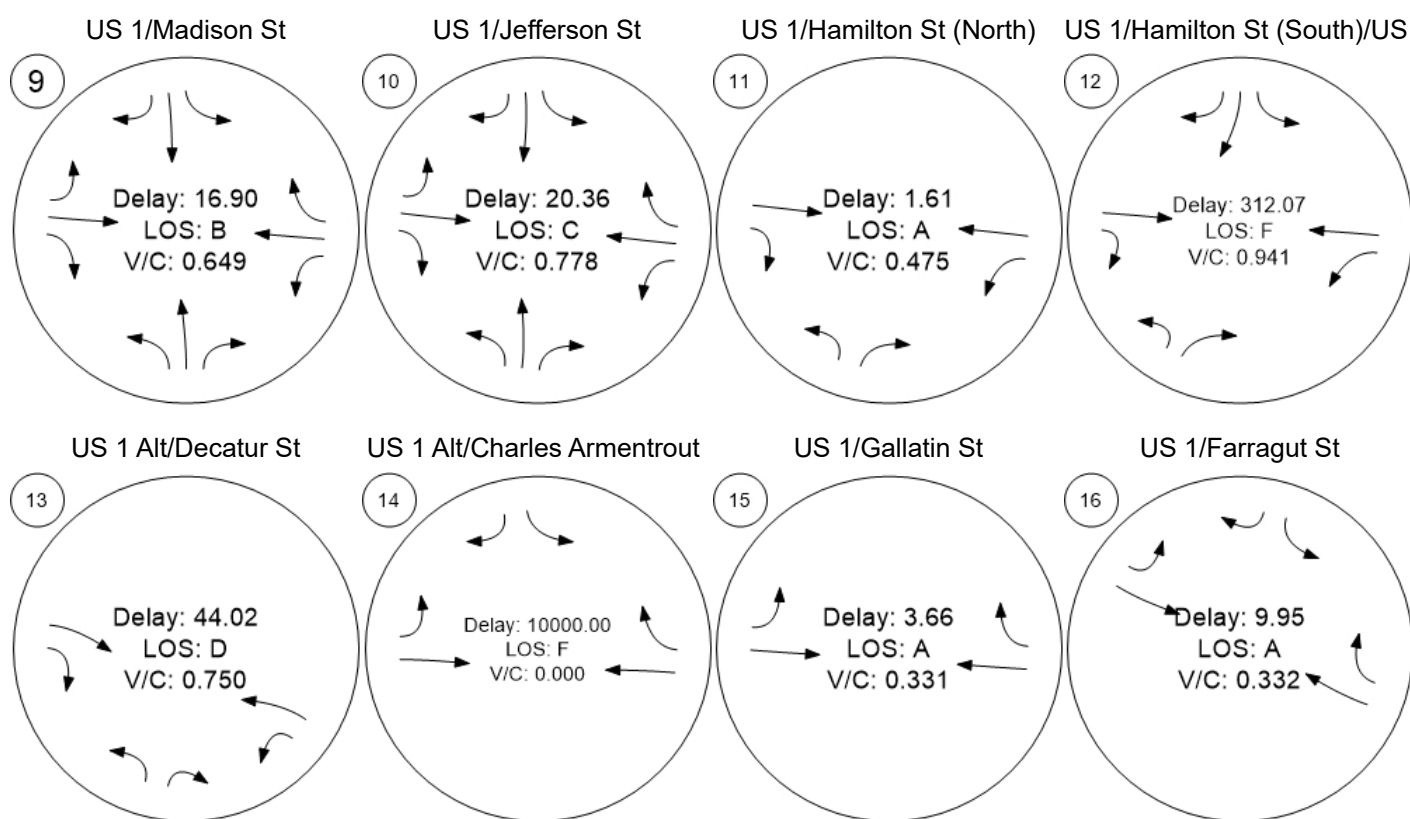
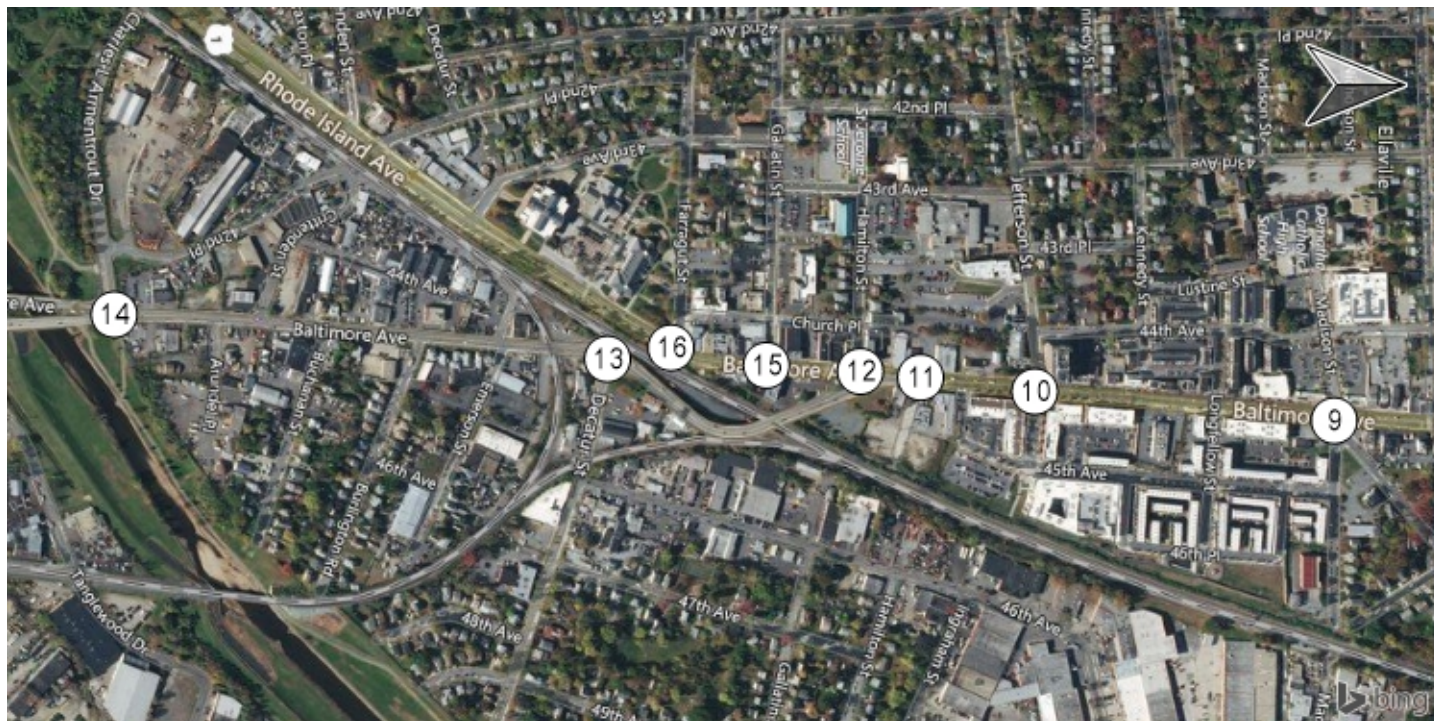


US 1/Oglethorpe Rd



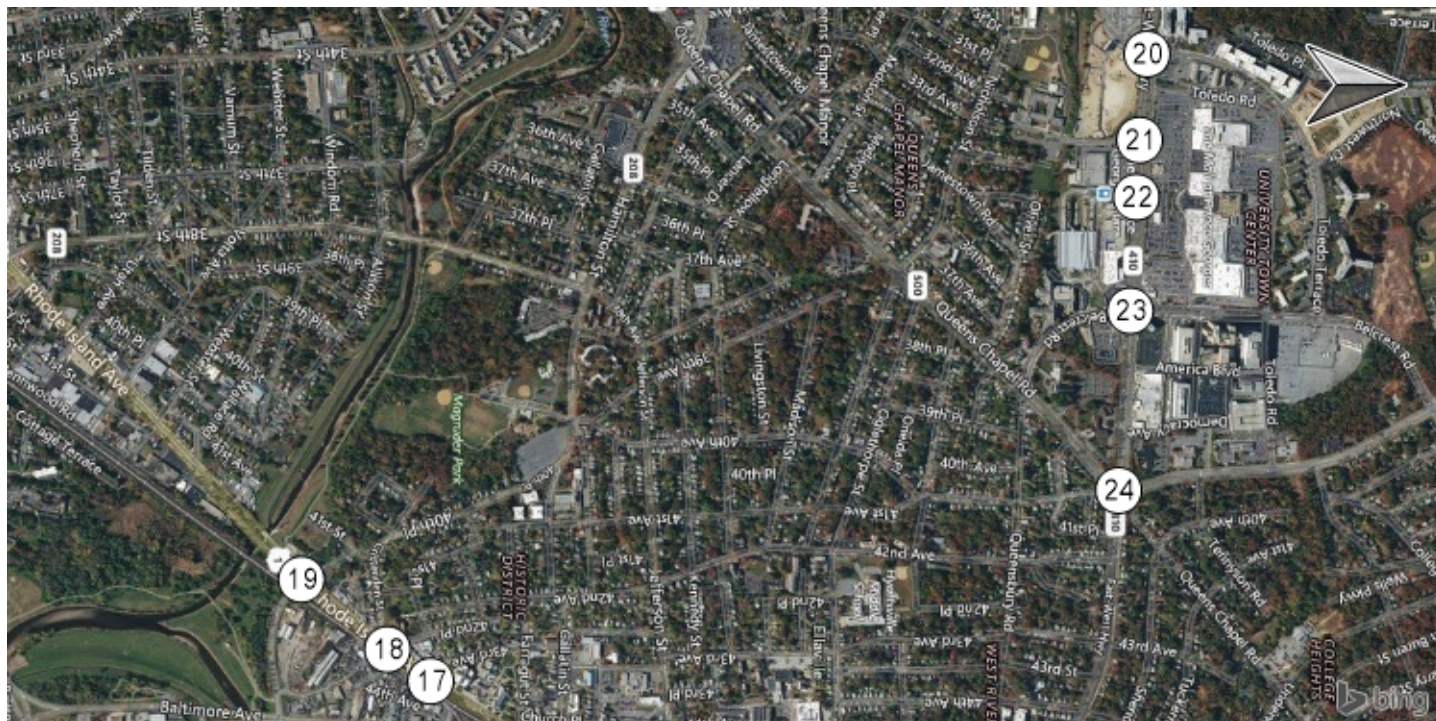


## Traffic Conditions

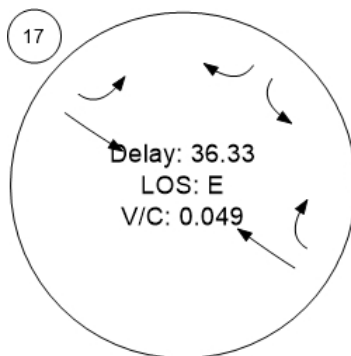




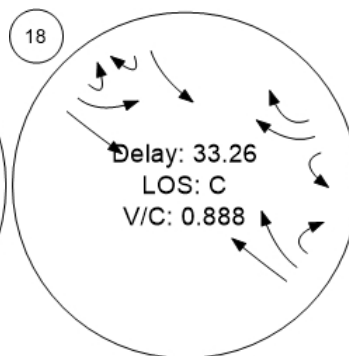
## Traffic Conditions



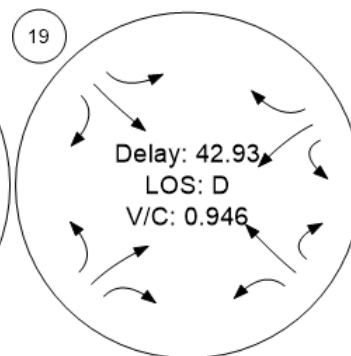
US 1/43rd Avenue



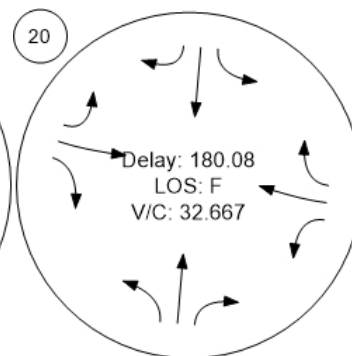
US 1/42nd Place/Crittendon



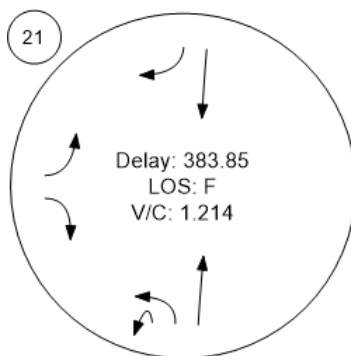
US 1/41st Place/Charles Arm



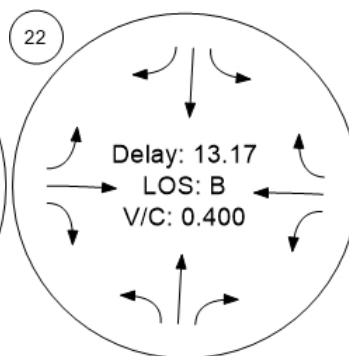
MD 410/Toledo Terrace



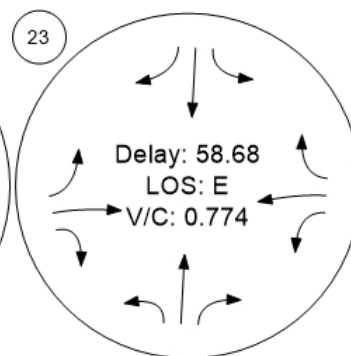
MD 410/Editors Park Dr



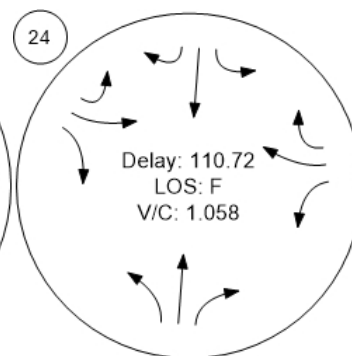
MD 410/Prince George's Plaz



MD 410/Belcrest Rd

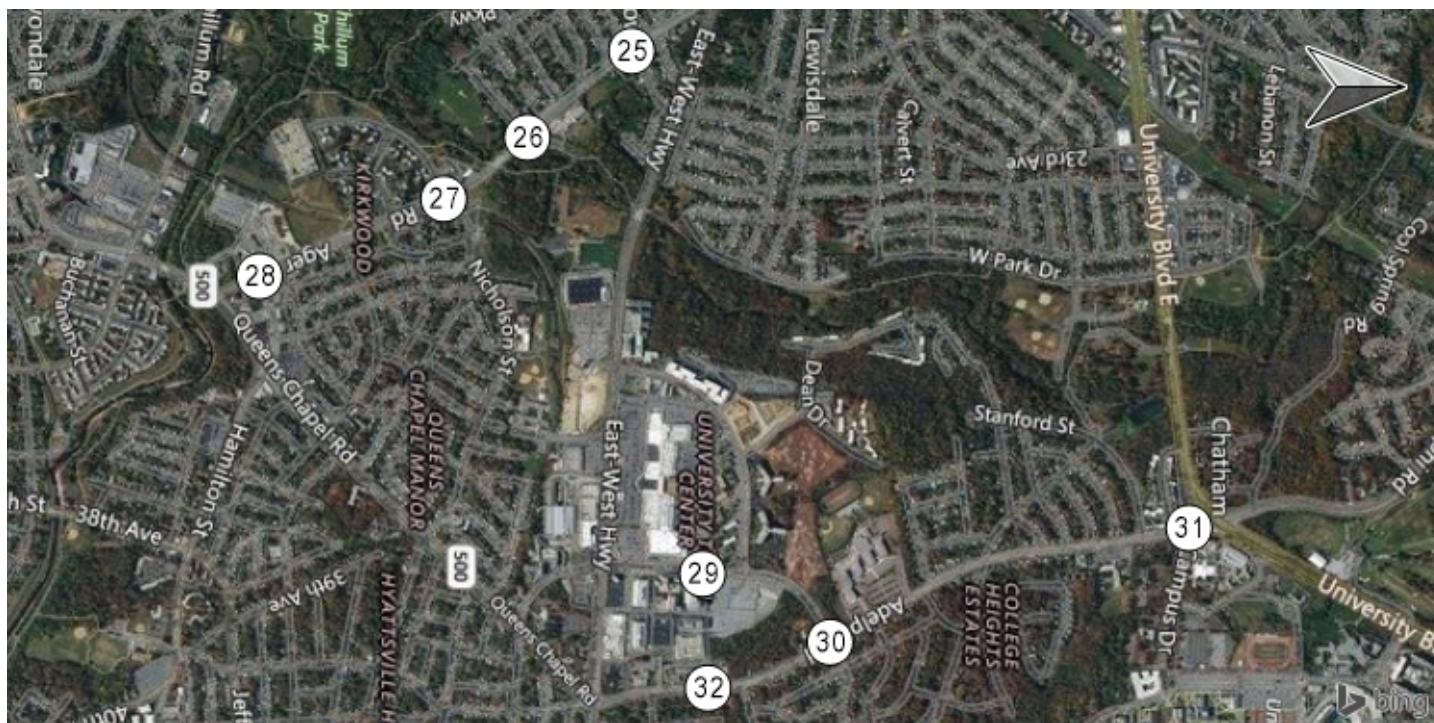


MD 410/MD 500/Adelphi Rd

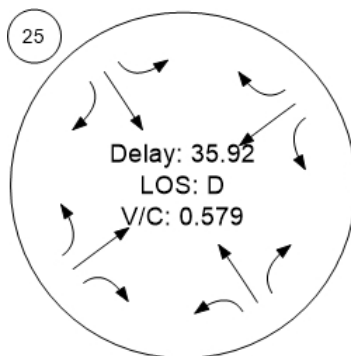




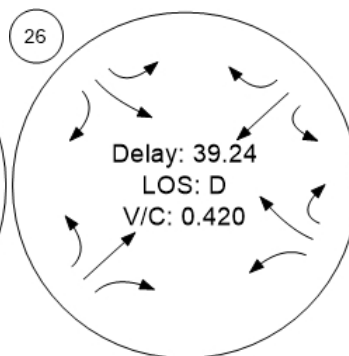
## Traffic Conditions



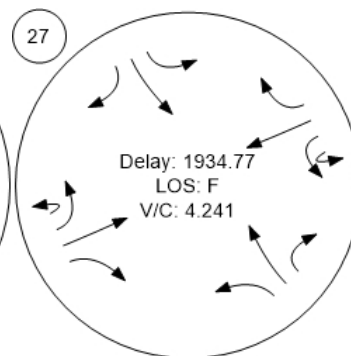
Ager Rd/23rd Ave



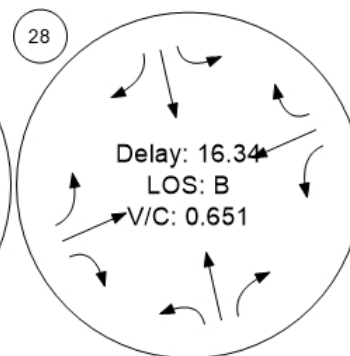
Ager Rd/Oglethorpe St/Scho



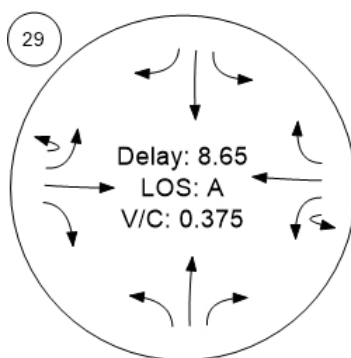
Ager Rd/Nicholson St



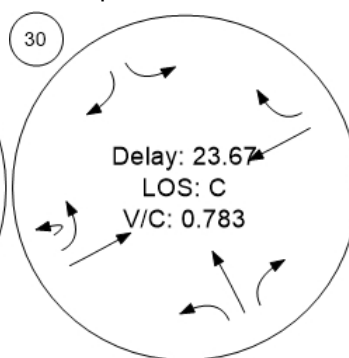
Ager Rd/Hamilton St



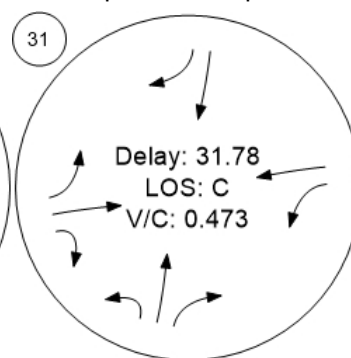
Toledo Rd/Belcrest Rd



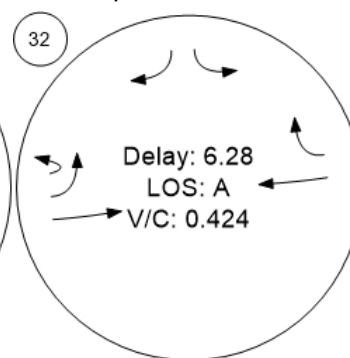
Adelphi Rd/Belcrest Rd



Adelphi Rd/Campus Dr



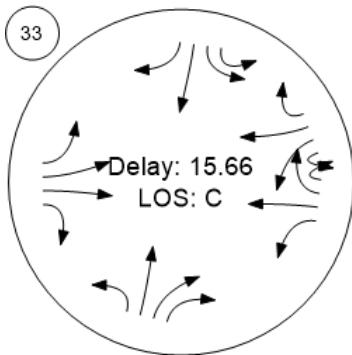
Adelphi Rd/Toledo Rd



# Traffic Conditions



Hamilton St/40th Pl/39th Ave



Hyattsville Transportation Plan

Vistro File: K:\...\2037 PM Build.vistro  
Report File: K:\...\2037 PM\_Build.pdf

Scenario: Base Scenario  
8/1/2018

**Intersection Analysis Summary**

| ID | Intersection Name                     | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
|----|---------------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| 1  | MD 500/Ager Rd                        | Signalized   | HCM 2010        | NEB Left   | 1.159 | 69.4          | E   |
| 2  | MD 500/Hamilton St                    | Signalized   | HCM 2010        | NEB Thru   | 1.038 | 108.3         | F   |
| 3  | MD 500/Nicholson St                   | Signalized   | HCM 2010        | SEB Left   | 0.631 | 13.7          | B   |
| 4  | MD 500/Belcrest Rd/Queensbury Rd      | Signalized   | HCM 2010        | EB Thru    | 0.761 | 26.3          | C   |
| 5  | MD 208(Hamilton St)/38th Ave          | Signalized   | HCM 2010        | SEB Left   | 0.957 | 48.4          | D   |
| 6  | US 1/MD 410                           | Signalized   | HCM 2010        | EB Left    | 1.038 | 122.4         | F   |
| 7  | US 1/Queensbury Rd                    | Signalized   | HCM 2010        | SB Left    | 0.861 | 28.9          | C   |
| 8  | US 1/Oglethorpe Rd                    | Signalized   | HCM 2010        | EB Left    | 0.505 | 6.6           | A   |
| 9  | US 1/Madison St                       | Signalized   | HCM 2010        | EB Right   | 0.475 | 10.7          | B   |
| 10 | US 1/Jefferson St                     | Signalized   | HCM 2010        | EB Right   | 0.595 | 18.4          | B   |
| 11 | US 1/Hamilton St (North)              | Two-way stop | HCM 2010        | WB Right   | 0.018 | 15.9          | C   |
| 12 | US 1/Hamilton St (South)/US 1 Alt     | Signalized   | HCM 2010        | SB Left    | 0.953 | 51.9          | D   |
| 13 | US 1 Alt/Decatur St                   | Signalized   | HCM 2010        | WB Right   | 0.720 | 19.6          | B   |
| 14 | US 1 Alt/Charles Armentrout St        | Signalized   | HCM 2010        | SB Thru    | 0.729 | 90.0          | F   |
| 15 | US 1/Gallatin St                      | Signalized   | HCM 2010        | EB Left    | 0.283 | 3.6           | A   |
| 16 | US 1/Farragut St                      | Signalized   | HCM 2010        | EB Left    | 0.565 | 10.3          | B   |
| 17 | US 1/43rd Ave                         | Two-way stop | HCM 6th Edition | SEB Left   | 0.099 | 21.6          | C   |
| 18 | US 1/42nd Place/Crittendon Street     | Signalized   | HCM 2010        | EB Right   | 0.892 | 55.0          | E   |
| 19 | US 1/41st Place/Charles Armentrout Dr | Signalized   | HCM 2010        | NWB Left   | 0.904 | 33.0          | C   |
| 20 | MD 410/Toledo Terrace                 | Signalized   | HCM 2010        | NB Left    | 0.758 | 46.1          | D   |
| 21 | MD 410/Editors Park Dr                | Signalized   | HCM 2010        | WB Left    | 0.777 | 8.4           | A   |
| 22 | MD 410/Prince George's Plaza          | Signalized   | HCM 2010        | NB Right   | 0.535 | 24.8          | C   |
| 23 | MD 410/Belcrest Rd                    | Signalized   | HCM 2010        | WB Left    | 0.967 | 67.9          | E   |
| 24 | MD 410/MD 500/Adelphi Rd              | Signalized   | HCM 2010        | NB Right   | 1.146 | 108.5         | F   |
| 25 | Ager Rd/23rd Ave                      | Signalized   | HCM 6th Edition | NEB Thru   | 0.432 | 18.7          | B   |
| 26 | Ager Rd/Oglethorpe St/School          | Signalized   | HCM 6th Edition | SEB Right  | 0.394 | 47.2          | D   |

|      |                              |              |                 |           |           |       |   |
|------|------------------------------|--------------|-----------------|-----------|-----------|-------|---|
| 27   | Ager Rd/Nicholson St         | Signalized   | HCM 2010        | NEB Right | 0.512     | 11.0  | B |
| 28   | Ager Rd/Hamilton St          | Signalized   | HCM 2010        | EB Left   | 1,901.841 | 37.7  | D |
| 29   | Toledo Rd/Belcrest Rd        | Signalized   | HCM 2010        | EB Left   | 0.549     | 15.2  | B |
| 30   | Adelphi Rd/Belcrest Rd       | Signalized   | HCM 2010        | SWB Left  | 0.873     | 35.2  | D |
| 31   | Adelphi Rd/Campus Dr         | Signalized   | HCM 2010        | WB Left   | 1.208     | 180.6 | F |
| 32   | Adelphi Rd/Toledo Rd         | Signalized   | HCM 2010        | EB Left   | 0.501     | 9.7   | A |
| 33   | Hamilton St/40th Pl/39th Ave | Roundabout   | HCM 2010        | EB Thru   |           | 8.9   | A |
| 4302 | New Intersection             | Two-way stop | HCM 6th Edition | NB Left   | 0.000     | 14.9  | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.



### Intersection Level Of Service Report

#### Intersection 1: MD 500/Ager Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 69.4  
 Level Of Service: E  
 Volume to Capacity (v/c): 1.159

#### Intersection Setup

| Name                   | Ager Rd.                                                                          |        | MD 500                                                                             |        | MD 500                                                                              |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Southbound                                                                        |        | Northeastbound                                                                     |        | Southwestbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Right  | Left                                                                               | Thru   | Thru                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1                                                                                  | 0      | 0                                                                                   | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 400.00                                                                             | 100.00 | 100.00                                                                              | 300.00 |
| Speed [mph]            | 35.00                                                                             |        | 40.00                                                                              |        | 40.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | No                                                                                  |        |

#### Volumes

| Name                                    | Ager Rd. |        | MD 500 |        | MD 500 |        |
|-----------------------------------------|----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 0        | 364    | 633    | 1298   | 1027   | 58     |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00     | 2.00   | 2.00   | 2.00   | 2.00   | 3.85   |
| Growth Rate                             | 1.00     | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0        | 37     | 61     | 81     | 44     | 0      |
| Diverted Trips [veh/h]                  | 0        | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0        | 401    | 694    | 1379   | 1071   | 58     |
| Peak Hour Factor                        | 1.0000   | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0        | 109    | 189    | 375    | 291    | 16     |
| Total Analysis Volume [veh/h]           | 0        | 436    | 754    | 1499   | 1164   | 63     |
| Presence of On-Street Parking           | No       | No     | No     | No     | No     | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 9        |        | 0      |        | 0      |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0      |        | 0      |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 22.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permissive | Overlap | Protected | Permissive | Split | Split |
|------------------------------|------------|---------|-----------|------------|-------|-------|
| Signal group                 | 0          | 4       | 1         | 2          | 2     | 0     |
| Auxiliary Signal Groups      |            | 1,4     |           |            |       |       |
| Lead / Lag                   | -          | -       | Lead      | -          | -     | -     |
| Minimum Green [s]            | 0          | 5       | 5         | 20         | 20    | 0     |
| Maximum Green [s]            | 0          | 43      | 30        | 36         | 36    | 0     |
| Amber [s]                    | 0.0        | 4.0     | 3.0       | 5.0        | 5.0   | 0.0   |
| All red [s]                  | 0.0        | 1.0     | 1.0       | 1.0        | 1.0   | 0.0   |
| Split [s]                    | 0          | 14      | 50        | 26         | 26    | 0     |
| Vehicle Extension [s]        | 0.0        | 3.0     | 3.0       | 3.0        | 3.0   | 0.0   |
| Walk [s]                     | 0          | 0       | 0         | 0          | 0     | 0     |
| Pedestrian Clearance [s]     | 0          | 0       | 0         | 0          | 0     | 0     |
| Rest In Walk                 |            | No      |           | No         | No    |       |
| I1, Start-Up Lost Time [s]   | 0.0        | 2.0     | 2.0       | 2.0        | 2.0   | 0.0   |
| I2, Clearance Lost Time [s]  | 0.0        | 3.0     | 2.0       | 4.0        | 4.0   | 0.0   |
| Minimum Recall               |            | No      | No        | No         | No    |       |
| Maximum Recall               |            | No      | No        | Yes        | Yes   |       |
| Pedestrian Recall            |            | No      | No        | No         | No    |       |
| Detector Location [ft]       | 0.0        | 0.0     | 0.0       | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 0.0        | 30.0    | 30.0      | 30.0       | 30.0  | 0.0   |
| I, Upstream Filtering Factor | 1.00       | 1.00    | 1.00      | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | R     | L      | C     | C     | R     |
|-----------------------------------------|-------|--------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90     | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00   | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 2.00   | 4.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 44    | 30     | 36    | 36    | 36    |
| g / C, Green / Cycle                    | 0.49  | 0.33   | 0.40  | 0.40  | 0.40  |
| (v / s)_i Volume / Saturation Flow Rate | 0.28  | 0.43   | 0.42  | 0.33  | 0.04  |
| s, saturation flow rate [veh/h]         | 1583  | 1774   | 3547  | 3547  | 1545  |
| c, Capacity [veh/h]                     | 775   | 590    | 1416  | 1416  | 617   |
| d1, Uniform Delay [s]                   | 16.20 | 30.07  | 27.07 | 24.20 | 16.95 |
| k, delay calibration                    | 0.32  | 0.50   | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.92  | 137.44 | 41.00 | 5.49  | 0.33  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |         |        |        |       |
|---------------------------------------|--------|---------|--------|--------|-------|
| X, volume / capacity                  | 0.56   | 1.28    | 1.06   | 0.82   | 0.10  |
| d, Delay for Lane Group [s/veh]       | 18.11  | 167.51  | 68.08  | 29.69  | 17.28 |
| Lane Group LOS                        | B      | F       | F      | C      | B     |
| Critical Lane Group                   | Yes    | Yes     | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 6.23   | 34.37   | 21.86  | 11.22  | 0.83  |
| 50th-Percentile Queue Length [ft/ln]  | 155.72 | 859.25  | 546.59 | 280.41 | 20.63 |
| 95th-Percentile Queue Length [veh/ln] | 10.32  | 50.86   | 30.73  | 16.71  | 1.49  |
| 95th-Percentile Queue Length [ft/ln]  | 258.05 | 1271.42 | 768.33 | 417.73 | 37.14 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |        |       |       |       |
|---------------------------------|-------|-------|--------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 0.00  | 18.11 | 167.51 | 68.08 | 29.69 | 17.28 |
| Movement LOS                    |       | B     | F      | F     | C     | B     |
| d_A, Approach Delay [s/veh]     | 18.11 |       | 101.36 |       | 29.05 |       |
| Approach LOS                    | B     |       | F      |       | C     |       |
| d_I, Intersection Delay [s/veh] | 69.43 |       |        |       |       |       |
| Intersection LOS                | E     |       |        |       |       |       |
| Intersection V/C                | 1.159 |       |        |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: MD 500/Hamilton St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 108.3  
 Level Of Service: F  
 Volume to Capacity (v/c): 1.038

#### Intersection Setup

| Name                   | MD 500                                                                            |       |       |       | MD 500                                                                            |        |        | Hamilton St                                                                         |        |        | Hamilton St                                                                         |        |       |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|-------|
| Approach               | Northeastbound                                                                    |       |       |       | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |       |
| Lane Configuration     |  |       |       |       |  |        |        |  |        |        |  |        |       |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00 |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 1     | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1     |
| Pocket Length [ft]     | 200.0                                                                             | 100.0 | 100.0 | 200.0 | 220.00                                                                            | 100.00 | 200.00 | 200.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 50.00 |
| Speed [mph]            | 40.00                                                                             |       |       |       | 40.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |       |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |       |
| Crosswalk              | Yes                                                                               |       |       |       | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |       |

#### Volumes

| Name                                    | MD 500 |       |       |       | MD 500 |        |        | Hamilton St |        |        | Hamilton St |        |        |
|-----------------------------------------|--------|-------|-------|-------|--------|--------|--------|-------------|--------|--------|-------------|--------|--------|
| Base Volume Input [veh/h]               | 2      | 149   | 1342  | 316   | 166    | 784    | 143    | 199         | 459    | 89     | 168         | 462    | 38     |
| Base Volume Adjustment Factor           | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 0.00  | 2.00  | 2.63  | 2.00   | 2.00   | 2.63   | 2.27        | 2.11   | 2.00   | 2.00        | 2.27   | 3.85   |
| Growth Rate                             | 1.00   | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0     | 81    | 0     | 11     | 44     | 48     | 0           | 36     | 20     | 29          | 22     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Total Hourly Volume [veh/h]             | 2      | 149   | 1423  | 316   | 177    | 828    | 191    | 199         | 495    | 109    | 197         | 484    | 38     |
| Peak Hour Factor                        | 0.920  | 0.920 | 0.920 | 0.920 | 0.9200 | 0.9200 | 0.9200 | 0.9200      | 0.9200 | 0.9200 | 0.9200      | 0.9200 | 0.9200 |
| Other Adjustment Factor                 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1      | 40    | 387   | 86    | 48     | 225    | 52     | 54          | 135    | 30     | 54          | 132    | 10     |
| Total Analysis Volume [veh/h]           | 2      | 162   | 1547  | 343   | 192    | 900    | 208    | 216         | 538    | 118    | 214         | 526    | 41     |
| Presence of On-Street Parking           | No     |       |       | No    | No     |        | No     | No          |        | No     | No          |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |       |       |       | 0      |        |        | 0           |        |        | 0           |        |        |
| Bicycle Volume [bicycles/h]             | 0      |       |       |       | 0      |        |        | 0           |        |        | 0           |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 180                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 23.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 16.00                           |

**Phasing & Timing**

| Control Type                 | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 1     | 1     | 6     | 6     | 5        | 2       | 2       | 3        | 8       | 8       | 7        | 4       | 4       |
| Auxiliary Signal Groups      |       |       |       |       |          |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lead  | Lead  | -     | -     | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 20    | 20    | 5        | 5       | 5       | 5        | 5       | 5       | 5        | 5       | 5       |
| Maximum Green [s]            | 29    | 29    | 30    | 30    | 30       | 30      | 30      | 25       | 75      | 75      | 25       | 75      | 75      |
| Amber [s]                    | 4.0   | 4.0   | 5.0   | 5.0   | 3.0      | 5.0     | 5.0     | 4.0      | 4.0     | 4.0     | 4.0      | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 1.0   | 1.0      | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     |
| Split [s]                    | 34    | 34    | 36    | 36    | 34       | 36      | 36      | 30       | 80      | 80      | 30       | 80      | 80      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 5.0   | 5.0   | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       |       | No    |       |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 4.0   | 4.0   | 2.0      | 4.0     | 4.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Minimum Recall               |       | No    | No    |       | No       | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    | Yes   |       | No       | Yes     |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |       | No    | No    |       | No       | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 5.0   | 5.0   | 5.0      | 5.0     | 5.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C      | R     | L     | C     | R     | L     | C     | L     | C     |
|-----------------------------------------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 180   | 180    | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00   | 6.00  | 6.00  | 6.00  | 6.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 4.00   | 4.00  | 0.00  | 4.00  | 4.00  | 0.00  | 3.00  | 0.00  | 3.00  |
| g_i, Effective Green Time [s]           | 79    | 58     | 58    | 79    | 62    | 62    | 90    | 68    | 90    | 70    |
| g / C, Green / Cycle                    | 0.44  | 0.32   | 0.32  | 0.44  | 0.34  | 0.34  | 0.50  | 0.38  | 0.50  | 0.39  |
| (v / s)_i Volume / Saturation Flow Rate | 0.19  | 0.44   | 0.22  | 0.28  | 0.25  | 0.13  | 0.21  | 0.36  | 0.22  | 0.31  |
| s, saturation flow rate [veh/h]         | 858   | 3547   | 1574  | 676   | 3547  | 1574  | 1025  | 1803  | 992   | 1834  |
| c, Capacity [veh/h]                     | 298   | 1152   | 511   | 249   | 1220  | 541   | 339   | 683   | 279   | 710   |
| d1, Uniform Delay [s]                   | 36.99 | 60.76  | 52.46 | 54.21 | 51.89 | 44.62 | 35.08 | 54.62 | 47.06 | 48.94 |
| k, delay calibration                    | 0.50  | 0.50   | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.31  | 0.11  | 0.21  |
| l, Upstream Filtering Factor            | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 7.11  | 160.08 | 6.86  | 20.23 | 4.01  | 2.06  | 8.89  | 19.14 | 4.43  | 4.07  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |         |        |        |        |        |        |         |        |        |
|---------------------------------------|--------|---------|--------|--------|--------|--------|--------|---------|--------|--------|
| X, volume / capacity                  | 0.55   | 1.34    | 0.67   | 0.77   | 0.74   | 0.38   | 0.64   | 0.96    | 0.77   | 0.80   |
| d, Delay for Lane Group [s/veh]       | 44.11  | 220.84  | 59.32  | 74.44  | 55.90  | 46.68  | 43.97  | 73.76   | 51.48  | 53.01  |
| Lane Group LOS                        | D      | F       | E      | E      | E      | D      | D      | E       | D      | D      |
| Critical Lane Group                   | No     | Yes     | No     | Yes    | No     | No     | No     | Yes     | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 5.03   | 51.60   | 14.33  | 6.70   | 18.45  | 7.37   | 6.24   | 32.46   | 5.69   | 23.38  |
| 50th-Percentile Queue Length [ft/ln]  | 125.79 | 1289.89 | 358.17 | 167.61 | 461.33 | 184.35 | 156.07 | 811.44  | 142.27 | 584.55 |
| 95th-Percentile Queue Length [veh/ln] | 8.71   | 75.30   | 20.53  | 10.95  | 25.50  | 11.83  | 10.34  | 41.80   | 9.60   | 31.31  |
| 95th-Percentile Queue Length [ft/ln]  | 217.76 | 1882.54 | 513.36 | 273.77 | 637.46 | 295.69 | 258.50 | 1045.03 | 240.07 | 782.80 |

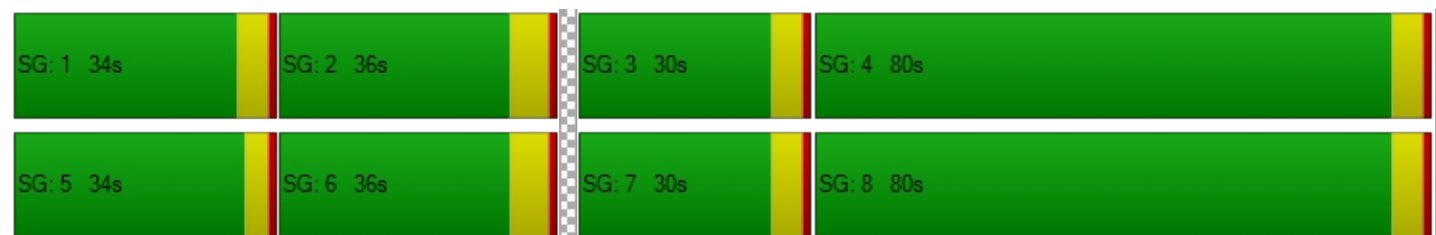


**Movement, Approach, & Intersection Results**

|                                 |        |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 44.11  | 44.11 | 220.8 | 59.32 | 74.44 | 55.90 | 46.68 | 43.97 | 73.76 | 73.76 | 51.48 | 53.01 | 53.01 |
| Movement LOS                    | D      | D     | F     | E     | E     | E     | D     | D     | E     | E     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 179.75 |       |       |       | 57.17 |       |       | 66.38 |       |       | 52.59 |       |       |
| Approach LOS                    | F      |       |       |       | E     |       |       | E     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 108.35 |       |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | F      |       |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 1.038  |       |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: MD 500/Nicholson St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 13.7  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.631

#### Intersection Setup

| Name                   | Nicholson St                                                                      |        |        | MD 500                                                                            |        |        | MD 500                                                                              |       |       |       | Nicholson St                                                                        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Westbound                                                                         |        |        | Northeastbound                                                                    |        |        | Southwestbound                                                                      |       |       |       | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |       |       |       |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0     | 0     | 0     | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 150.00                                                                            | 100.00 | 100.00 | 150.0                                                                               | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |       |       |       | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |       |       |       | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |       |       |       | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Nicholson St |        |        | MD 500 |        |        | MD 500 |       |       |       | Nicholson St |        |        |
|-----------------------------------------|--------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 9            | 11     | 11     | 42     | 1548   | 41     | 1      | 35    | 1100  | 98    | 96           | 17     | 35     |
| Base Volume Adjustment Factor           | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00         | 0.00   | 0.00   | 0.00   | 2.00   | 0.00   | 0.00   | 0.00  | 2.00  | 0.00  | 2.27         | 0.00   | 0.00   |
| Growth Rate                             | 1.00         | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00         | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0            | 0      | 0      | 0      | 130    | 0      | 0      | 0     | 103   | 0     | 0            | 0      | 0      |
| Diverted Trips [veh/h]                  | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 9            | 11     | 11     | 42     | 1678   | 41     | 1      | 35    | 1203  | 98    | 96           | 17     | 35     |
| Peak Hour Factor                        | 0.9000       | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.900  | 0.900 | 0.900 | 0.900 | 0.9000       | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3            | 3      | 3      | 12     | 466    | 11     | 0      | 10    | 334   | 27    | 27           | 5      | 10     |
| Total Analysis Volume [veh/h]           | 10           | 12     | 12     | 47     | 1864   | 46     | 1      | 39    | 1337  | 109   | 107          | 19     | 39     |
| Presence of On-Street Parking           | No           |        | No     | No     |        | No     | No     |       |       | No    | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0            |        |        | 0      |        |        | 0      |       |       |       | 0            |        |        |
| Bicycle Volume [bicycles/h]             | 0            |        |        | 0      |        |        | 0      |       |       |       | 0            |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permi | Prote | Permi | Permi | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|----------|---------|---------|-------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 5        | 2       | 0       | 0     | 1     | 6     | 0     | 0       | 8       | 0       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |       |       |       |       |         |         |         |
| Lead / Lag                   | -       | -       | -       | Lead     | -       | -       | -     | Lead  | -     | -     | -       | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 5        | 5       | 0       | 0     | 5     | 5     | 0     | 0       | 5       | 0       |
| Maximum Green [s]            | 0       | 30      | 0       | 30       | 30      | 0       | 0     | 30    | 30    | 0     | 0       | 30      | 0       |
| Amber [s]                    | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 0.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     | 0.0   | 1.0   | 1.0   | 0.0   | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 0       | 25      | 0       | 10       | 85      | 0       | 0     | 10    | 85    | 0     | 0       | 25      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 0.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0       | 5       | 0       | 0        | 5       | 0       | 0     | 0     | 5     | 0     | 0       | 5       | 0       |
| Pedestrian Clearance [s]     | 0       | 10      | 0       | 0        | 10      | 0       | 0     | 0     | 10    | 0     | 0       | 10      | 0       |
| Rest In Walk                 |         | No      |         |          | No      |         |       |       | No    |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 0.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 0.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     |
| Minimum Recall               |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Maximum Recall               |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Pedestrian Recall            |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L    | C    | C    | L    | C    | C    | C     |
|-----------------------------------------|-------|------|------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 48    | 48   | 48   | 48   | 48   | 48   | 48   | 48    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00  |
| g_i, Effective Green Time [s]           | 6     | 34   | 27   | 27   | 34   | 27   | 27   | 6     |
| g / C, Green / Cycle                    | 0.13  | 0.70 | 0.57 | 0.57 | 0.70 | 0.57 | 0.57 | 0.13  |
| (v / s)_i Volume / Saturation Flow Rate | 0.02  | 0.08 | 0.51 | 0.52 | 0.09 | 0.39 | 0.39 | 0.10  |
| s, saturation flow rate [veh/h]         | 1772  | 560  | 1863 | 1847 | 430  | 1863 | 1814 | 1572  |
| c, Capacity [veh/h]                     | 331   | 514  | 1069 | 1060 | 418  | 1059 | 1031 | 331   |
| d1, Uniform Delay [s]                   | 18.41 | 4.36 | 8.92 | 9.00 | 8.22 | 7.33 | 7.37 | 20.08 |
| k, delay calibration                    | 0.11  | 0.11 | 0.32 | 0.32 | 0.11 | 0.18 | 0.18 | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 0.13  | 0.08 | 7.71 | 8.38 | 0.10 | 1.32 | 1.41 | 1.16  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |      |        |        |      |        |        |       |
|---------------------------------------|-------|------|--------|--------|------|--------|--------|-------|
| X, volume / capacity                  | 0.10  | 0.09 | 0.89   | 0.90   | 0.10 | 0.69   | 0.69   | 0.50  |
| d, Delay for Lane Group [s/veh]       | 18.55 | 4.43 | 16.63  | 17.38  | 8.32 | 8.65   | 8.78   | 21.24 |
| Lane Group LOS                        | B     | A    | B      | B      | A    | A      | A      | C     |
| Critical Lane Group                   | No    | No   | No     | Yes    | Yes  | No     | No     | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 0.31  | 0.06 | 7.74   | 7.97   | 0.06 | 3.81   | 3.78   | 1.69  |
| 50th-Percentile Queue Length [ft/ln]  | 7.80  | 1.59 | 193.50 | 199.18 | 1.40 | 95.32  | 94.50  | 42.35 |
| 95th-Percentile Queue Length [veh/ln] | 0.56  | 0.11 | 12.30  | 12.60  | 0.10 | 6.86   | 6.80   | 3.05  |
| 95th-Percentile Queue Length [ft/ln]  | 14.04 | 2.86 | 307.56 | 314.90 | 2.53 | 171.58 | 170.11 | 76.24 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |      |      |      |      |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 18.55 | 18.55 | 18.55 | 4.43  | 16.99 | 17.38 | 8.32 | 8.32 | 8.71 | 8.78 | 21.24 | 21.24 | 21.24 |
| Movement LOS                    | B     | B     | B     | A     | B     | B     | A    | A    | A    | A    | C     | C     | C     |
| d_A, Approach Delay [s/veh]     | 18.55 |       |       | 16.70 |       |       | 8.70 |      |      |      | 21.24 |       |       |
| Approach LOS                    | B     |       |       | B     |       |       | A    |      |      |      | C     |       |       |
| d_I, Intersection Delay [s/veh] | 13.66 |       |       |       |       |       |      |      |      |      |       |       |       |
| Intersection LOS                | B     |       |       |       |       |       |      |      |      |      |       |       |       |
| Intersection V/C                | 0.631 |       |       |       |       |       |      |      |      |      |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 4: MD 500/Belcrest Rd/Queensbury Rd

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 26.3  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.761 |

#### Intersection Setup

| Name                   |                                                                                   |        |        | Queensbury Road                                                                   |        |        | MD 500                                                                              |        |        | MD 500                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Eastbound                                                                         |        |        | Westbound                                                                         |        |        | Northeastbound                                                                      |        |        | Southwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 150.00 | 100.00                                                                            | 100.00 | 100.00 | 375.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Queensbury Road |        |        | MD 500 |        |        | MD 500 |        |        |
|-----------------------------------------|--------|--------|--------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 85     | 211    | 614    | 66              | 203    | 37     | 472    | 1120   | 87     | 30     | 658    | 36     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85   | 2.38   | 2.21   | 3.85            | 2.38   | 3.85   | 2.21   | 2.08   | 2.78   | 3.70   | 1.97   | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00            | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 55     | 0               | 0      | 0      | 71     | 59     | 0      | 0      | 48     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 85     | 211    | 669    | 66              | 203    | 37     | 543    | 1179   | 87     | 30     | 706    | 36     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000          | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 24     | 59     | 186    | 18              | 56     | 10     | 151    | 328    | 24     | 8      | 196    | 10     |
| Total Analysis Volume [veh/h]           | 94     | 234    | 743    | 73              | 226    | 41     | 603    | 1310   | 97     | 33     | 784    | 40     |
| Presence of On-Street Parking           | No     |        | No     | No              |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 6      |        |        | 18              |        |        | 1      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0               |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 63.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Unsigna | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 4       | 4       | 0       | 8       | 8       | 8       | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 0       | 20      | 20      | 20      | 5        | 20      | 20      | 10       | 20      | 20      |
| Maximum Green [s]            | 40      | 40      | 0       | 40      | 40      | 40      | 40       | 53      | 53      | 40       | 53      | 53      |
| Amber [s]                    | 4.0     | 4.0     | 0.0     | 4.0     | 4.0     | 4.0     | 4.0      | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     |
| All red [s]                  | 1.0     | 1.0     | 0.0     | 1.0     | 1.0     | 1.0     | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 2.0     |
| Split [s]                    | 45      | 45      | 0       | 45      | 45      | 45      | 45       | 60      | 60      | 45       | 60      | 60      |
| Vehicle Extension [s]        | 6.0     | 6.0     | 0.0     | 4.0     | 4.0     | 4.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0     | 3.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Minimum Recall               |         | Yes     |         |         | Yes     |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 30.0    | 30.0    | 30.0    | 0.0      | 0.0     | 0.0     | 30.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 93    | 93    | 93    | 93    | 93    | 93    | 93    | 93    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 0.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 29    | 29    | 52    | 41    | 41    | 52    | 34    | 34    |
| g / C, Green / Cycle                    | 0.31  | 0.31  | 0.56  | 0.44  | 0.44  | 0.56  | 0.37  | 0.37  |
| (v / s)_i Volume / Saturation Flow Rate | 0.26  | 0.25  | 0.31  | 0.38  | 0.39  | 0.05  | 0.22  | 0.22  |
| s, saturation flow rate [veh/h]         | 1242  | 1383  | 1932  | 1861  | 1812  | 606   | 1863  | 1831  |
| c, Capacity [veh/h]                     | 437   | 478   | 1000  | 825   | 803   | 321   | 688   | 676   |
| d1, Uniform Delay [s]                   | 29.56 | 28.23 | 13.80 | 23.13 | 23.52 | 15.57 | 23.76 | 23.77 |
| k, delay calibration                    | 0.41  | 0.18  | 0.11  | 0.19  | 0.20  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 9.36  | 3.17  | 0.59  | 4.50  | 5.83  | 0.14  | 0.86  | 0.87  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |       |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.75   | 0.71   | 0.60   | 0.85   | 0.88   | 0.10  | 0.60   | 0.60   |
| d, Delay for Lane Group [s/veh]       | 38.92  | 31.40  | 14.39  | 27.63  | 29.35  | 15.71 | 24.62  | 24.64  |
| Lane Group LOS                        | D      | C      | B      | C      | C      | B     | C      | C      |
| Critical Lane Group                   | Yes    | No     | No     | No     | Yes    | Yes   | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 7.91   | 7.02   | 3.18   | 13.98  | 14.46  | 0.27  | 6.94   | 6.83   |
| 50th-Percentile Queue Length [ft/ln]  | 197.72 | 175.45 | 79.38  | 349.39 | 361.58 | 6.85  | 173.42 | 170.63 |
| 95th-Percentile Queue Length [veh/ln] | 12.52  | 11.36  | 5.72   | 20.11  | 20.70  | 0.49  | 11.26  | 11.11  |
| 95th-Percentile Queue Length [ft/ln]  | 313.03 | 284.07 | 142.89 | 502.67 | 517.50 | 12.33 | 281.41 | 277.74 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 38.92 | 38.92 | 0.00 | 31.40 | 31.40 | 31.40 | 14.39 | 28.43 | 29.35 | 15.71 | 24.63 | 24.64 |
| Movement LOS                    | D     | D     |      | C     | C     | C     | B     | C     | C     | B     | C     | C     |
| d_A, Approach Delay [s/veh]     | 38.92 |       |      | 31.40 |       |       | 24.26 |       |       | 24.29 |       |       |
| Approach LOS                    | D     |       |      | C     |       |       | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 26.31 |       |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.761 |       |      |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 5: MD 208(Hamilton St)/38th Ave

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 48.4  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.957

#### Intersection Setup

| Name                   |                                                                                   |        |        | Hamilton St                                                                       |        |        | 38th Ave                                                                            |        |        | Hamilton St                                                                         |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Westbound                                                                         |        |        | Southwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 125.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 35.00                                                                             |        |        | 30.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Hamilton St |        |        | 38th Ave |        |        | Hamilton St |        |        |
|-----------------------------------------|--------|--------|--------|-------------|--------|--------|----------|--------|--------|-------------|--------|--------|
| Base Volume Input [veh/h]               | 244    | 185    | 32     | 23          | 424    | 35     | 63       | 125    | 185    | 197         | 369    | 162    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.27   | 3.33   | 0.00   | 3.70        | 2.00   | 0.00   | 0.00     | 2.22   | 1.89   | 1.69        | 1.88   | 1.65   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Site-Generated Trips [veh/h]            | 44     | 0      | 0      | 0           | 12     | 0      | 0        | 0      | 0      | 0           | 7      | 26     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Total Hourly Volume [veh/h]             | 288    | 185    | 32     | 23          | 436    | 35     | 63       | 125    | 185    | 197         | 376    | 188    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 80     | 51     | 9      | 6           | 121    | 10     | 18       | 35     | 51     | 55          | 104    | 52     |
| Total Analysis Volume [veh/h]           | 320    | 206    | 36     | 26          | 484    | 39     | 70       | 139    | 206    | 219         | 418    | 209    |
| Presence of On-Street Parking           | No     |        | No     | No          |        | No     | No       |        | No     | No          |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Pedestrian Volume [ped/h]               | 5      |        |        | 4           |        |        | 5        |        |        | 6           |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0           |        |        | 0        |        |        | 0           |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 90                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Semi-actuated                |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 2       | 8       | 8       | 8       | 6       | 6       | 6       | 4       | 4       | 4       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 20      | 20      | 20      | 15      | 15      | 15      | 20      | 20      | 20      |
| Maximum Green [s]            | 15       | 45      | 45      | 35      | 35      | 35      | 20      | 20      | 20      | 35      | 35      | 35      |
| Amber [s]                    | 4.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0      | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 25       | 50      | 50      | 40      | 40      | 40      | 25      | 25      | 25      | 40      | 40      | 40      |
| Vehicle Extension [s]        | 3.0      | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               | Yes      | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | Yes      | Yes     |         |         | Yes     |         |         | Yes     |         |         | Yes     |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0     | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L     | C     | C     | L      | C     |
|-----------------------------------------|-------|-------|-------|-------|--------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90    | 90     | 90    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00   | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 2.00  | 0.00  | 2.00  | 2.00   | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 3.00  | 3.00  | 3.00  | 3.00   | 3.00  |
| g_i, Effective Green Time [s]           | 45    | 35    | 35    | 25    | 35     | 35    |
| g / C, Green / Cycle                    | 0.50  | 0.39  | 0.39  | 0.28  | 0.39   | 0.39  |
| (v / s)_i Volume / Saturation Flow Rate | 0.49  | 0.03  | 0.28  | 0.25  | 0.25   | 0.36  |
| s, saturation flow rate [veh/h]         | 1150  | 782   | 1838  | 1658  | 877    | 1757  |
| c, Capacity [veh/h]                     | 677   | 104   | 715   | 504   | 189    | 683   |
| d1, Uniform Delay [s]                   | 17.38 | 43.77 | 23.49 | 31.38 | 41.79  | 26.13 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50   | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  |
| d2, Incremental Delay [s]               | 11.30 | 5.73  | 6.52  | 14.07 | 115.27 | 19.28 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  |

**Lane Group Results**

|                                       |        |       |        |        |        |        |
|---------------------------------------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.83   | 0.25  | 0.73   | 0.82   | 1.16   | 0.92   |
| d, Delay for Lane Group [s/veh]       | 28.67  | 49.50 | 30.02  | 45.45  | 157.05 | 45.41  |
| Lane Group LOS                        | C      | D     | C      | D      | F      | D      |
| Critical Lane Group                   | Yes    | No    | No     | Yes    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 10.05  | 0.73  | 10.19  | 10.37  | 10.18  | 15.52  |
| 50th-Percentile Queue Length [ft/ln]  | 251.17 | 18.33 | 254.75 | 259.33 | 254.40 | 388.04 |
| 95th-Percentile Queue Length [veh/ln] | 15.25  | 1.32  | 15.43  | 15.66  | 16.79  | 21.98  |
| 95th-Percentile Queue Length [ft/ln]  | 381.13 | 32.99 | 385.63 | 391.39 | 419.68 | 549.57 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |        |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 28.67 | 28.67 | 28.67 | 49.50 | 30.02 | 30.02 | 45.45 | 45.45 | 45.45 | 157.05 | 45.41 | 45.41 |
| Movement LOS                    | C     | C     | C     | D     | C     | C     | D     | D     | D     | F      | D     | D     |
| d_A, Approach Delay [s/veh]     | 28.67 |       |       | 30.94 |       |       | 45.45 |       |       | 74.31  |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | D     |       |       | E      |       |       |
| d_I, Intersection Delay [s/veh] | 48.41 |       |       |       |       |       |       |       |       |        |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |        |       |       |
| Intersection V/C                | 0.957 |       |       |       |       |       |       |       |       |        |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 6: US 1/MD 410

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 122.4  
 Level Of Service: F  
 Volume to Capacity (v/c): 1.038

#### Intersection Setup

| Name                   | US 1       |        |        | US 1       |        |        | MD 410    |        |        | MD 410    |        |        |
|------------------------|------------|--------|--------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| Approach               | Northbound |        |        | Southbound |        |        | Eastbound |        |        | Westbound |        |        |
| Lane Configuration     | T T T      |        |        | T T        |        |        | T T T     |        |        | T T T T   |        |        |
| Turning Movement       | Left       | Thru   | Right  | Left       | Thru   | Right  | Left      | Thru   | Right  | Left      | Thru   | Right  |
| Lane Width [ft]        | 12.00      | 12.00  | 12.00  | 12.00      | 12.00  | 12.00  | 12.00     | 12.00  | 12.00  | 12.00     | 12.00  | 12.00  |
| No. of Lanes in Pocket | 2          | 0      | 0      | 1          | 0      | 0      | 1         | 0      | 0      | 1         | 0      | 1      |
| Pocket Length [ft]     | 200.00     | 100.00 | 100.00 | 225.00     | 100.00 | 100.00 | 600.00    | 100.00 | 100.00 | 700.00    | 100.00 | 450.00 |
| Speed [mph]            | 45.00      |        |        | 45.00      |        |        | 50.00     |        |        | 40.00     |        |        |
| Grade [%]              | 0.00       |        |        | 0.00       |        |        | 0.00      |        |        | 0.00      |        |        |
| Crosswalk              | Yes        |        |        | Yes        |        |        | Yes       |        |        | Yes       |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 450    | 549    | 64     | 232    | 606    | 199    | 336    | 1602   | 380    | 245    | 1383   | 158    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.15   | 2.00   | 2.38   | 2.07   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.03   | 1.67   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 28     | 0      | 0      | 0      | 0      | 28     | 15     | 33     | 15     | 0      | 56     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 478    | 549    | 64     | 232    | 606    | 227    | 351    | 1635   | 395    | 245    | 1439   | 158    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 133    | 153    | 18     | 64     | 168    | 63     | 98     | 454    | 110    | 68     | 400    | 44     |
| Total Analysis Volume [veh/h]           | 531    | 610    | 71     | 258    | 673    | 252    | 390    | 1817   | 439    | 272    | 1599   | 176    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 3      |        |        | 6      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0      |        |        | 0      |        |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 180                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 9.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 1        | 6       | 6       | 5        | 2       | 0       | 7        | 4       | 4       | 3        | 8       | 8       |
| Auxiliary Signal Groups      |          |         |         |          |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 5        | 25      | 0       | 5        | 15      | 15      | 5        | 25      | 25      |
| Maximum Green [s]            | 29       | 38      | 38      | 29       | 38      | 0       | 24       | 66      | 66      | 24       | 66      | 66      |
| Amber [s]                    | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 0.0     | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 0.0     | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 2.0     |
| Split [s]                    | 34       | 45      | 45      | 34       | 45      | 0       | 29       | 72      | 72      | 29       | 72      | 72      |
| Vehicle Extension [s]        | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 0.0     | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Walk [s]                     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 4.5     | 4.5     | 3.0      | 4.5     | 0.0     | 3.0      | 4.5     | 4.5     | 3.0      | 4.5     | 4.5     |
| Minimum Recall               | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               | No       | Yes     |         | No       | Yes     |         | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 5.0     | 5.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | L      | C      | R     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|--------|--------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 180   | 180   | 180   | 180   | 180   | 180   | 180    | 180    | 180   | 180   | 180   | 180   |
| L, Total Lost Time per Cycle [s]        | 6.50  | 6.50  | 6.50  | 6.50  | 6.50  | 6.50  | 5.00   | 6.50   | 6.50  | 5.00  | 6.50  | 6.50  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 4.50  | 4.50  | 0.00  | 4.50  | 4.50  | 3.00   | 4.50   | 4.50  | 3.00  | 4.50  | 4.50  |
| g_i, Effective Green Time [s]           | 72    | 46    | 46    | 72    | 43    | 43    | 24     | 73     | 73    | 17    | 66    | 66    |
| g / C, Green / Cycle                    | 0.40  | 0.26  | 0.26  | 0.40  | 0.24  | 0.24  | 0.13   | 0.41   | 0.41  | 0.09  | 0.36  | 0.36  |
| (v / s)_i Volume / Saturation Flow Rate | 0.26  | 0.19  | 0.19  | 0.23  | 0.26  | 0.26  | 0.22   | 0.51   | 0.28  | 0.08  | 0.33  | 0.34  |
| s, saturation flow rate [veh/h]         | 2035  | 1863  | 1792  | 1098  | 1863  | 1688  | 1774   | 3547   | 1583  | 3445  | 3546  | 1770  |
| c, Capacity [veh/h]                     | 621   | 477   | 459   | 371   | 443   | 402   | 237    | 1437   | 642   | 317   | 1290  | 644   |
| d1, Uniform Delay [s]                   | 52.87 | 61.17 | 61.22 | 41.69 | 68.59 | 68.59 | 78.00  | 53.52  | 44.04 | 80.57 | 54.59 | 54.82 |
| k, delay calibration                    | 0.29  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50   | 0.50   | 0.50  | 0.11  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 8.82  | 9.29  | 9.75  | 10.35 | 69.74 | 74.22 | 310.15 | 124.55 | 5.84  | 6.73  | 11.55 | 20.83 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

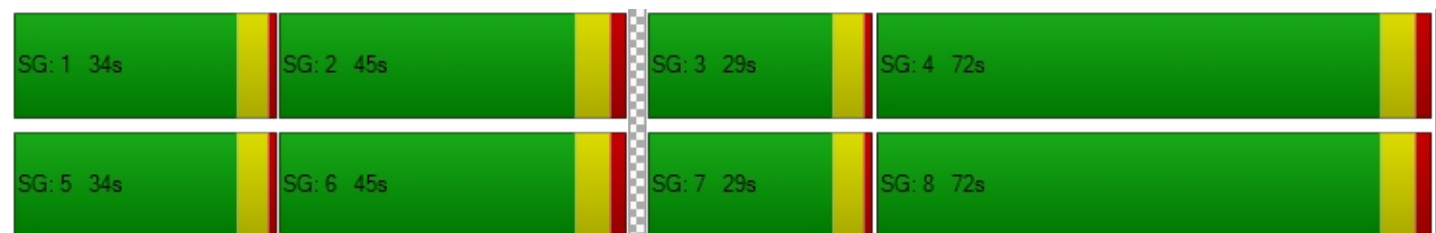
|                                       |        |        |        |        |        |        |         |         |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.86   | 0.73   | 0.73   | 0.70   | 1.09   | 1.10   | 1.65    | 1.26    | 0.68   | 0.86   | 0.92   | 0.92   |
| d, Delay for Lane Group [s/veh]       | 61.69  | 70.46  | 70.98  | 52.04  | 138.32 | 142.81 | 388.15  | 178.07  | 49.88  | 87.30  | 66.14  | 75.65  |
| Lane Group LOS                        | E      | E      | E      | D      | F      | F      | F       | F       | D      | F      | E      | E      |
| Critical Lane Group                   | Yes    | No     | No     | No     | No     | Yes    | No      | Yes     | No     | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 9.02   | 15.53  | 15.07  | 9.01   | 28.68  | 26.50  | 31.17   | 56.21   | 16.79  | 6.51   | 27.27  | 29.19  |
| 50th-Percentile Queue Length [ft/ln]  | 225.42 | 388.30 | 376.76 | 225.13 | 717.08 | 662.45 | 779.26  | 1405.14 | 419.81 | 162.72 | 681.72 | 729.74 |
| 95th-Percentile Queue Length [veh/ln] | 13.94  | 22.00  | 21.44  | 13.93  | 39.48  | 36.93  | 48.20   | 80.07   | 23.51  | 10.69  | 35.83  | 38.05  |
| 95th-Percentile Queue Length [ft/ln]  | 348.53 | 549.88 | 535.93 | 348.17 | 987.02 | 923.35 | 1204.98 | 2001.70 | 587.82 | 267.32 | 895.82 | 951.25 |

**Movement, Approach, & Intersection Results**

|                                 |        |       |       |        |        |        |        |        |       |       |       |       |
|---------------------------------|--------|-------|-------|--------|--------|--------|--------|--------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 61.69  | 70.68 | 70.98 | 52.04  | 139.58 | 142.81 | 388.15 | 178.07 | 49.88 | 87.30 | 68.63 | 75.65 |
| Movement LOS                    | E      | E     | E     | D      | F      | F      | F      | F      | D     | F     | E     | E     |
| d_A, Approach Delay [s/veh]     | 66.76  |       |       | 121.18 |        |        | 187.77 |        |       | 71.71 |       |       |
| Approach LOS                    | E      |       |       | F      |        |        | F      |        |       | E     |       |       |
| d_I, Intersection Delay [s/veh] | 122.45 |       |       |        |        |        |        |        |       |       |       |       |
| Intersection LOS                | F      |       |       |        |        |        |        |        |       |       |       |       |
| Intersection V/C                | 1.038  |       |       |        |        |        |        |        |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 7: US 1/Queensbury Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 28.9  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.861

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Queensbury                                                                          |        |        | Queensbury                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 250.00                                                                            | 100.00 | 100.00 | 150.00                                                                            | 100.00 | 100.00 | 350.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 200.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 45.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | No                                                                                |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Queensbury |        |        | Queensbury |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 77     | 892    | 155    | 205    | 900    | 114    | 50         | 276    | 85     | 44         | 148    | 140    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 1.89   | 3.85   | 2.00   | 3.85   | 1.96       | 2.30   | 1.85   | 1.69       | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 28     | 0      | 0      | 15     | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 77     | 920    | 155    | 205    | 915    | 114    | 50         | 276    | 85     | 44         | 148    | 140    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 21     | 256    | 43     | 57     | 254    | 32     | 14         | 77     | 24     | 12         | 41     | 39     |
| Total Analysis Volume [veh/h]           | 86     | 1022   | 172    | 228    | 1017   | 127    | 56         | 307    | 94     | 49         | 164    | 156    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No         |        | No     | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 11     |        |        | 11         |        |        | 4          |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0          |        |        | 0          |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 2       | 6       | 6       | 6       | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 15      | 15      | 15      | 8       | 8       | 8       | 8       | 8       | 8       |
| Maximum Green [s]            | 9        | 50      | 50      | 36      | 36      | 36      | 29      | 29      | 29      | 29      | 29      | 29      |
| Amber [s]                    | 3.5      | 4.5     | 4.5     | 4.5     | 4.5     | 4.5     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0      | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 14       | 56      | 56      | 42      | 42      | 42      | 34      | 34      | 34      | 34      | 34      | 34      |
| Vehicle Extension [s]        | 3.0      | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 2.5      | 3.5     | 3.5     | 3.5     | 3.5     | 3.5     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | No       | Yes     |         |         | Yes     |         |         | No      |         |         | No      |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 294.0   | 294.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0     | 6.0     | 6.0     | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L      | C     | C     | L     | C     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90     | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.50  | 5.50  | 5.50  | 5.50   | 5.50  | 5.50  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 2.00   | 0.00  | 0.00  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 3.50  | 3.50  | 3.50   | 3.50  | 3.50  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 52    | 52    | 52    | 43     | 43    | 43    | 27    | 27    | 27    | 27    | 27    |
| g / C, Green / Cycle                    | 0.58  | 0.58  | 0.58  | 0.48   | 0.48  | 0.48  | 0.30  | 0.30  | 0.30  | 0.30  | 0.30  |
| (v / s)_i Volume / Saturation Flow Rate | 0.13  | 0.33  | 0.33  | 0.50   | 0.31  | 0.32  | 0.05  | 0.22  | 0.05  | 0.09  | 0.10  |
| s, saturation flow rate [veh/h]         | 661   | 1863  | 1769  | 458    | 1863  | 1786  | 1209  | 1784  | 983   | 1863  | 1566  |
| c, Capacity [veh/h]                     | 388   | 1080  | 1025  | 199    | 895   | 858   | 332   | 541   | 151   | 565   | 475   |
| d1, Uniform Delay [s]                   | 11.32 | 11.82 | 11.85 | 38.05  | 17.66 | 17.74 | 29.54 | 28.16 | 40.73 | 23.94 | 24.24 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50   | 0.50  | 0.50  | 0.11  | 0.21  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.31  | 2.14  | 2.29  | 109.48 | 3.65  | 3.90  | 0.24  | 3.89  | 1.22  | 0.28  | 0.40  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |        |        |       |        |       |        |        |
|---------------------------------------|-------|--------|--------|--------|--------|--------|-------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.22  | 0.57   | 0.57   | 1.15   | 0.65   | 0.66   | 0.17  | 0.74   | 0.32  | 0.29   | 0.33   |
| d, Delay for Lane Group [s/veh]       | 12.63 | 13.96  | 14.14  | 147.53 | 21.31  | 21.64  | 29.77 | 32.05  | 41.95 | 24.22  | 24.64  |
| Lane Group LOS                        | B     | B      | B      | F      | C      | C      | C     | C      | D     | C      | C      |
| Critical Lane Group                   | Yes   | No     | No     | Yes    | No     | No     | No    | Yes    | No    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 0.77  | 6.96   | 6.71   | 10.29  | 8.88   | 8.68   | 1.01  | 8.09   | 1.10  | 2.65   | 2.57   |
| 50th-Percentile Queue Length [ft/ln]  | 19.26 | 174.05 | 167.65 | 257.37 | 222.03 | 217.04 | 25.32 | 202.32 | 27.44 | 66.34  | 64.17  |
| 95th-Percentile Queue Length [veh/ln] | 1.39  | 11.29  | 10.95  | 16.96  | 13.77  | 13.51  | 1.82  | 12.76  | 1.98  | 4.78   | 4.62   |
| 95th-Percentile Queue Length [ft/ln]  | 34.66 | 282.24 | 273.82 | 423.94 | 344.22 | 337.85 | 45.58 | 318.95 | 49.39 | 119.42 | 115.51 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |        |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 12.63 | 14.04 | 14.14 | 147.53 | 21.45 | 21.64 | 29.77 | 32.05 | 32.05 | 41.95 | 24.22 | 24.64 |
| Movement LOS                    | B     | B     | B     | F      | C     | C     | C     | C     | C     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 13.96 |       |       | 42.42  |       |       | 31.78 |       |       | 26.75 |       |       |
| Approach LOS                    | B     |       |       | D      |       |       | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 28.88 |       |       |        |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |        |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.861 |       |       |        |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 8: US 1/Oglethorpe Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 6.6  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.505

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Oglethorpe                                                                          |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 35.00                                                                             |        | 40.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | No                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Oglethorpe |        |
|-----------------------------------------|--------|--------|--------|--------|------------|--------|
| Base Volume Input [veh/h]               | 43     | 1153   | 1049   | 9      | 54         | 28     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.04   | 1.97   | 0.00   | 1.67       | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0          | 0      |
| Site-Generated Trips [veh/h]            | 0      | 28     | 15     | 0      | 0          | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0          | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0          | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0          | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0          | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0          | 0      |
| Total Hourly Volume [veh/h]             | 43     | 1181   | 1064   | 9      | 54         | 28     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 12     | 328    | 296    | 3      | 15         | 8      |
| Total Analysis Volume [veh/h]           | 48     | 1312   | 1182   | 10     | 60         | 31     |
| Presence of On-Street Parking           | No     | No     | No     | No     | No         | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0          | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0          | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0          |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0          |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 105.0                           |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 2          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |       |       |
| Lead / Lag                   | Lag        | -          | -          | -          | Lag   | -     |
| Minimum Green [s]            | 15         | 15         | 15         | 15         | 15    | 15    |
| Maximum Green [s]            | 85         | 85         | 85         | 85         | 25    | 25    |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 90         | 90         | 90         | 90         | 30    | 30    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 0          | 0          | 0          | 0          | 0     | 0     |
| Pedestrian Clearance [s]     | 0          | 0          | 0          | 0          | 0     | 0     |
| Rest In Walk                 |            | No         | No         |            | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Minimum Recall               |            | No         | No         |            | No    |       |
| Maximum Recall               |            | Yes        | Yes        |            | No    |       |
| Pedestrian Recall            |            | No         | No         |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C    | C    | C     |
|-----------------------------------------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00 | 3.00 | 3.00 | 3.00 | 3.00  |
| g_i, Effective Green Time [s]           | 96   | 96   | 96   | 96   | 14    |
| g / C, Green / Cycle                    | 0.80 | 0.80 | 0.80 | 0.80 | 0.12  |
| (v / s)_i Volume / Saturation Flow Rate | 0.42 | 0.41 | 0.32 | 0.32 | 0.05  |
| s, saturation flow rate [veh/h]         | 1615 | 1694 | 1863 | 1858 | 1738  |
| c, Capacity [veh/h]                     | 1318 | 1349 | 1484 | 1479 | 209   |
| d1, Uniform Delay [s]                   | 3.89 | 4.20 | 3.66 | 3.67 | 48.99 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 1.40 | 1.39 | 0.81 | 0.82 | 1.42  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.51   | 0.51   | 0.40   | 0.40   | 0.43   |
| d, Delay for Lane Group [s/veh]       | 5.30   | 5.58   | 4.47   | 4.48   | 50.41  |
| Lane Group LOS                        | A      | A      | A      | A      | D      |
| Critical Lane Group                   | Yes    | No     | No     | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 4.34   | 4.77   | 3.34   | 3.35   | 2.65   |
| 50th-Percentile Queue Length [ft/ln]  | 108.61 | 119.28 | 83.50  | 83.64  | 66.13  |
| 95th-Percentile Queue Length [veh/ln] | 7.76   | 8.35   | 6.01   | 6.02   | 4.76   |
| 95th-Percentile Queue Length [ft/ln]  | 194.07 | 208.83 | 150.29 | 150.55 | 119.04 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |       |       |
|---------------------------------|-------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 5.30  | 5.45 | 4.48 | 4.48 | 50.41 | 50.41 |
| Movement LOS                    | A     | A    | A    | A    | D     | D     |
| d_A, Approach Delay [s/veh]     | 5.44  |      | 4.48 |      | 50.41 |       |
| Approach LOS                    | A     |      | A    |      | D     |       |
| d_I, Intersection Delay [s/veh] | 6.56  |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |       |       |
| Intersection V/C                | 0.505 |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 90s

SG: 4 30s

SG: 6 90s

### Intersection Level Of Service Report

#### Intersection 9: US 1/Madison St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 10.7  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.475

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Madison                                                                             |        |        | Madison                                                                             |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Madison |        |        | Madison |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|---------|--------|--------|---------|--------|--------|
| Base Volume Input [veh/h]               | 15     | 1162   | 85     | 19     | 1029   | 27     | 19      | 16     | 26     | 16      | 5      | 21     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.00   | 0.00   | 0.00   | 2.00   | 0.00   | 0.00    | 0.00   | 0.00   | 0.00    | 0.00   | 1.61   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00    | 1.00   | 1.00   | 1.00    | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 28     | 0      | 0      | 15     | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Total Hourly Volume [veh/h]             | 15     | 1190   | 85     | 19     | 1044   | 27     | 19      | 16     | 26     | 16      | 5      | 21     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000  | 0.9000 | 0.9000 | 0.9000  | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4      | 331    | 24     | 5      | 290    | 8      | 5       | 4      | 7      | 4       | 1      | 6      |
| Total Analysis Volume [veh/h]           | 17     | 1322   | 94     | 21     | 1160   | 30     | 21      | 18     | 29     | 18      | 6      | 23     |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No      |        | No     | No      |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 2       |        |        | 0       |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0       |        |        | 0       |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 105.0                           |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 2       | 2       | 2       | 6       | 6       | 6       | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 20      | 20      | 20      | 20      | 15      | 15      | 15      | 15      | 15      | 15      |
| Maximum Green [s]            | 85      | 85      | 85      | 85      | 85      | 85      | 25      | 25      | 25      | 25      | 25      | 25      |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 90      | 90      | 90      | 90      | 90      | 90      | 30      | 30      | 30      | 30      | 30      | 30      |
| Vehicle Extension [s]        | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               |         | Yes     |         |         | Yes     |         |         | Yes     |         |         | Yes     |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | C    | L     | C    | C    | C     | C     |
|-----------------------------------------|-------|------|------|-------|------|------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120  | 120  | 120   | 120  | 120  | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00 | 5.00 | 5.00  | 5.00 | 5.00 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 2.00  | 0.00 | 0.00 | 2.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00 | 3.00 | 3.00  | 3.00 | 3.00 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 85    | 85   | 85   | 85    | 85   | 85   | 25    | 25    |
| g / C, Green / Cycle                    | 0.71  | 0.71 | 0.71 | 0.71  | 0.71 | 0.71 | 0.21  | 0.21  |
| (v / s)_i Volume / Saturation Flow Rate | 0.04  | 0.38 | 0.39 | 0.05  | 0.32 | 0.32 | 0.04  | 0.03  |
| s, saturation flow rate [veh/h]         | 478   | 1863 | 1820 | 385   | 1863 | 1846 | 1633  | 1595  |
| c, Capacity [veh/h]                     | 325   | 1319 | 1289 | 257   | 1319 | 1308 | 380   | 374   |
| d1, Uniform Delay [s]                   | 12.32 | 8.28 | 8.31 | 15.13 | 7.51 | 7.52 | 39.11 | 38.64 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50 | 0.50 | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.31  | 1.60 | 1.65 | 0.62  | 1.12 | 1.14 | 1.03  | 0.69  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |        |       |       |
|---------------------------------------|-------|--------|--------|-------|--------|--------|-------|-------|
| X, volume / capacity                  | 0.05  | 0.54   | 0.54   | 0.08  | 0.45   | 0.45   | 0.18  | 0.13  |
| d, Delay for Lane Group [s/veh]       | 12.63 | 9.88   | 9.96   | 15.75 | 8.64   | 8.65   | 40.14 | 39.33 |
| Lane Group LOS                        | B     | A      | A      | B     | A      | A      | D     | D     |
| Critical Lane Group                   | No    | No     | Yes    | No    | No     | No     | Yes   | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.23  | 8.25   | 8.14   | 0.34  | 6.23   | 6.18   | 1.79  | 1.22  |
| 50th-Percentile Queue Length [ft/ln]  | 5.86  | 206.21 | 203.52 | 8.42  | 155.69 | 154.53 | 44.68 | 30.45 |
| 95th-Percentile Queue Length [veh/ln] | 0.42  | 12.96  | 12.82  | 0.61  | 10.32  | 10.26  | 3.22  | 2.19  |
| 95th-Percentile Queue Length [ft/ln]  | 10.54 | 323.96 | 320.51 | 15.15 | 258.01 | 256.47 | 80.42 | 54.81 |



**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 12.63 | 9.92 | 9.96 | 15.75 | 8.64 | 8.65 | 40.14 | 40.14 | 40.14 | 39.33 | 39.33 | 39.33 |
| Movement LOS                    | B     | A    | A    | B     | A    | A    | D     | D     | D     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 9.95  |      |      | 8.77  |      |      | 40.14 |       |       | 39.33 |       |       |
| Approach LOS                    | A     |      |      | A     |      |      | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 10.68 |      |      |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.475 |      |      |       |      |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 10: US 1/Jefferson St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 18.4  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.595

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Jefferson St                                                                        |        |        | Jefferson St                                                                        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00 | 175.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | No                                                                                |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Jefferson St |        |        | Jefferson St |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 171    | 1136   | 32     | 63     | 958    | 63     | 76           | 49     | 130    | 59           | 52     | 34     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.82   | 2.00   | 2.00   | 2.00   | 2.00   | 2.22   | 1.43         | 2.00   | 1.82   | 2.00         | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 28     | 0      | 0      | 15     | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 171    | 1164   | 32     | 63     | 973    | 63     | 76           | 49     | 130    | 59           | 52     | 34     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 0.9000       | 1.0000 | 0.9000 | 1.0000       | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 48     | 323    | 8      | 16     | 270    | 18     | 21           | 12     | 36     | 15           | 13     | 9      |
| Total Analysis Volume [veh/h]           | 190    | 1293   | 32     | 63     | 1081   | 70     | 84           | 49     | 144    | 59           | 52     | 34     |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 108.0                           |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 0       | 0       | 6       | 6       | 4       | 4       | 4       | 0       | 4       | 0       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | -       | -       | -       | Lag     | -       | -       | -       | -       | -       |
| Minimum Green [s]            | 8        | 20      | 0       | 0       | 20      | 20      | 20      | 20      | 20      | 0       | 20      | 0       |
| Maximum Green [s]            | 15       | 85      | 0       | 0       | 65      | 65      | 25      | 25      | 25      | 0       | 25      | 0       |
| Amber [s]                    | 4.0      | 4.0     | 0.0     | 0.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                  | 1.0      | 1.0     | 0.0     | 0.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 20       | 90      | 0       | 0       | 70      | 70      | 30      | 30      | 30      | 0       | 30      | 0       |
| Vehicle Extension [s]        | 3.0      | 3.0     | 0.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 3.0     | 0.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 0.0     | 3.0     | 0.0     |
| Minimum Recall               | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | No       | Yes     |         |         | Yes     |         |         | No      |         |         | No      |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | L     | C     | C     | C     | C     |
|-----------------------------------------|------|------|------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120   | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 0.00 | 3.00 | 3.00 | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 85   | 85   | 85   | 72    | 72    | 72    | 25    | 25    |
| g / C, Green / Cycle                    | 0.71 | 0.71 | 0.71 | 0.60  | 0.60  | 0.60  | 0.21  | 0.21  |
| (v / s)_i Volume / Saturation Flow Rate | 0.29 | 0.36 | 0.36 | 0.15  | 0.31  | 0.31  | 0.19  | 0.13  |
| s, saturation flow rate [veh/h]         | 655  | 1863 | 1847 | 412   | 1863  | 1823  | 1436  | 1074  |
| c, Capacity [veh/h]                     | 465  | 1322 | 1311 | 234   | 1119  | 1095  | 336   | 265   |
| d1, Uniform Delay [s]                   | 9.02 | 7.86 | 7.87 | 23.70 | 13.91 | 13.92 | 46.84 | 42.46 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  | 0.36  | 0.17  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 2.65 | 1.37 | 1.39 | 2.82  | 1.73  | 1.77  | 15.28 | 2.76  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |        |        |        |
|---------------------------------------|-------|--------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.41  | 0.50   | 0.50   | 0.27  | 0.52   | 0.52   | 0.82   | 0.55   |
| d, Delay for Lane Group [s/veh]       | 11.68 | 9.23   | 9.26   | 26.52 | 15.64  | 15.69  | 62.12  | 45.22  |
| Lane Group LOS                        | B     | A      | A      | C     | B      | B      | E      | D      |
| Critical Lane Group                   | No    | No     | Yes    | No    | No     | No     | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 1.74  | 7.29   | 7.27   | 1.39  | 9.15   | 8.99   | 9.61   | 4.10   |
| 50th-Percentile Queue Length [ft/ln]  | 43.54 | 182.35 | 181.66 | 34.64 | 228.84 | 224.70 | 240.20 | 102.43 |
| 95th-Percentile Queue Length [veh/ln] | 3.13  | 11.72  | 11.69  | 2.49  | 14.12  | 13.90  | 14.69  | 7.38   |
| 95th-Percentile Queue Length [ft/ln]  | 78.37 | 293.08 | 292.19 | 62.34 | 352.89 | 347.62 | 367.28 | 184.38 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 11.68 | 9.24 | 9.26 | 26.52 | 15.66 | 15.69 | 62.12 | 62.12 | 62.12 | 45.22 | 45.22 | 45.22 |
| Movement LOS                    | B     | A    | A    | C     | B     | B     | E     | E     | E     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 9.55  |      |      | 16.23 |       |       | 62.12 |       |       | 45.22 |       |       |
| Approach LOS                    | A     |      |      | B     |       |       | E     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 18.38 |      |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.595 |      |      |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 11: US 1/Hamilton St (North)

Control Type: Two-way stop  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 15.9  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.018

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                                |        | Hamilton                                                                            |        |
|------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                          |        | Westbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                                | Thru   | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1                                                                                   | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 150.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 35.00                                                                               |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Hamilton |        |
|-----------------------------------------|--------|--------|--------|--------|----------|--------|
| Base Volume Input [veh/h]               | 1394   | 0      | 3      | 999    | 0        | 5      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 3.85   | 0.00   | 2.04   | 0.00     | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 28     | 0      | 0      | 15     | 0        | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 1422   | 0      | 3      | 1014   | 0        | 5      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 395    | 0      | 1      | 282    | 0        | 1      |
| Total Analysis Volume [veh/h]           | 1580   | 0      | 3      | 1127   | 0        | 6      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0        |        |

**Intersection Settings**

| Priority Scheme                    | Free | Free | Stop |
|------------------------------------|------|------|------|
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |       |       |
|---------------------------------------|------|------|------|------|-------|-------|
| V/C, Movement V/C Ratio               | 0.02 | 0.00 | 0.00 | 0.01 | 0.00  | 0.02  |
| d_M, Delay for Movement [s/veh]       | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 15.87 |
| Movement LOS                          | A    | A    |      | A    |       | C     |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.05  |
| 95th-Percentile Queue Length [ft/ln]  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 1.36  |
| d_A, Approach Delay [s/veh]           | 0.00 |      | 0.00 |      | 15.87 |       |
| Approach LOS                          | A    |      | A    |      | C     |       |
| d_I, Intersection Delay [s/veh]       | 0.04 |      |      |      |       |       |
| Intersection LOS                      | C    |      |      |      |       |       |



### Intersection Level Of Service Report

#### Intersection 12: US 1/Hamilton St (South)/US 1 Alt

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 51.9  |
| Analysis Method: | HCM 2010   | Level Of Service:         | D     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.953 |

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Hamilton  |        |        | US 1 ALT                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-----------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound |        |        | Northwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |           |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left      | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00     | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0         | 0      | 0      | 0                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00    | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 250.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 25.00     |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00      |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes       |        |        | No                                                                                  |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Hamilton |        |        | US 1 ALT |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]               | 0      | 658    | 81     | 634    | 459    | 0      | 5        | 28     | 7      | 47       | 57     | 717    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.17   | 0.00   | 2.00   | 2.06   | 0.00   | 0.00     | 0.00   | 0.00   | 2.63     | 0.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 12     | 0      | 8      | 7      | 0      | 0        | 0      | 0      | 0        | 0      | 16     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0      | 670    | 81     | 642    | 466    | 0      | 5        | 28     | 7      | 47       | 57     | 733    |
| Peak Hour Factor                        | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 | 0.9000   | 0.9000 | 0.9000 | 0.9000   | 1.0000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0      | 186    | 23     | 178    | 129    | 0      | 1        | 8      | 2      | 13       | 14     | 204    |
| Total Analysis Volume [veh/h]           | 0      | 744    | 90     | 713    | 518    | 0      | 6        | 31     | 8      | 52       | 57     | 814    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     |          |        |        | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 3        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Semi-actuated                   |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Split | Split | Permiss | Permiss | Overlap |
|------------------------------|---------|---------|---------|----------|---------|---------|---------|-------|-------|---------|---------|---------|
| Signal group                 | 0       | 6       | 6       | 5        | 2       | 0       | 3       | 3     | 3     | 8       | 8       | 8       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |         |       |       |         |         | 5,8     |
| Lead / Lag                   | -       | -       | -       | Lead     | -       | -       | -       | -     | -     | Lag     | -       | -       |
| Minimum Green [s]            | 0       | 20      | 20      | 5        | 20      | 0       | 0       | 0     | 0     | 5       | 5       | 5       |
| Maximum Green [s]            | 0       | 40      | 40      | 20       | 79      | 0       | 0       | 0     | 0     | 30      | 30      | 30      |
| Amber [s]                    | 0.0     | 4.0     | 4.0     | 3.5      | 4.0     | 0.0     | 0.0     | 0.0   | 0.0   | 3.0     | 3.0     | 3.0     |
| All red [s]                  | 0.0     | 1.0     | 1.0     | 1.5      | 1.0     | 0.0     | 0.0     | 0.0   | 0.0   | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 0       | 45      | 45      | 39       | 84      | 0       | 0       | 0     | 0     | 36      | 36      | 36      |
| Vehicle Extension [s]        | 0.0     | 3.0     | 3.0     | 3.0      | 3.0     | 0.0     | 0.0     | 0.0   | 0.0   | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0     | 0     | 5       | 5       | 5       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0     | 0     | 10      | 10      | 10      |
| Rest In Walk                 |         | No      |         |          | No      |         |         |       |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 2.0     | 2.0      | 2.0     | 0.0     | 0.0     | 0.0   | 0.0   | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 3.0     | 3.0      | 3.0     | 0.0     | 0.0     | 0.0   | 0.0   | 2.0     | 2.0     | 2.0     |
| Minimum Recall               |         | No      |         | Yes      | No      |         |         |       |       |         | No      | No      |
| Maximum Recall               |         | Yes     |         | Yes      | Yes     |         |         |       |       |         | No      | No      |
| Pedestrian Recall            |         | No      |         | No       | No      |         |         |       |       |         | No      | No      |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 50.0    | 50.0    | 0.0      | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C    | C    |  | C     | R     |
|-----------------------------------------|-------|-------|-------|------|------|--|-------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120  | 120  |  | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00 | 5.00 |  | 4.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 |  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 0.00  | 3.00 | 3.00 |  | 2.00  | 0.00  |
| g_i, Effective Green Time [s]           | 40    | 40    | 79    | 79   | 79   |  | 32    | 70    |
| g / C, Green / Cycle                    | 0.33  | 0.33  | 0.66  | 0.66 | 0.66 |  | 0.27  | 0.58  |
| (v / s)_i Volume / Saturation Flow Rate | 0.22  | 0.23  | 0.71  | 0.18 | 0.18 |  | 0.06  | 0.51  |
| s, saturation flow rate [veh/h]         | 1860  | 1791  | 1005  | 1470 | 1470 |  | 1856  | 1583  |
| c, Capacity [veh/h]                     | 620   | 597   | 610   | 968  | 968  |  | 495   | 924   |
| d1, Uniform Delay [s]                   | 34.37 | 34.76 | 27.35 | 8.50 | 8.50 |  | 34.28 | 21.44 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50 | 0.50 |  | 0.11  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 5.74  | 6.65  | 92.62 | 0.68 | 0.68 |  | 0.22  | 11.85 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 |  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |  |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--|--------|--------|
| X, volume / capacity                  | 0.67   | 0.70   | 1.17   | 0.27   | 0.27   |  | 0.22   | 0.88   |
| d, Delay for Lane Group [s/veh]       | 40.12  | 41.41  | 119.97 | 9.18   | 9.18   |  | 34.50  | 33.28  |
| Lane Group LOS                        | D      | D      | F      | A      | A      |  | C      | C      |
| Critical Lane Group                   | No     | Yes    | Yes    | No     | No     |  | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 11.38  | 11.61  | 24.89  | 2.86   | 2.86   |  | 2.55   | 21.85  |
| 50th-Percentile Queue Length [ft/ln]  | 284.59 | 290.34 | 622.29 | 71.41  | 71.41  |  | 63.83  | 546.33 |
| 95th-Percentile Queue Length [veh/ln] | 16.92  | 17.20  | 37.27  | 5.14   | 5.14   |  | 4.60   | 29.52  |
| 95th-Percentile Queue Length [ft/ln]  | 422.93 | 430.07 | 931.67 | 128.53 | 128.53 |  | 114.90 | 738.00 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |        |      |      |      |      |      |       |       |       |
|---------------------------------|-------|-------|-------|--------|------|------|------|------|------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 0.00  | 40.68 | 41.41 | 119.97 | 9.18 | 9.18 | 0.00 | 0.00 | 0.00 | 34.50 | 34.50 | 33.28 |
| Movement LOS                    |       | D     | D     | F      | A    | A    |      |      |      | C     | C     | C     |
| d_A, Approach Delay [s/veh]     | 40.76 |       |       | 73.35  |      |      | 0.00 |      |      | 33.43 |       |       |
| Approach LOS                    | D     |       |       | E      |      |      | A    |      |      | C     |       |       |
| d_I, Intersection Delay [s/veh] | 51.92 |       |       |        |      |      |      |      |      |       |       |       |
| Intersection LOS                | D     |       |       |        |      |      |      |      |      |       |       |       |
| Intersection V/C                | 0.953 |       |       |        |      |      |      |      |      |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 13: US 1 Alt/Decatur St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 19.6  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.720

#### Intersection Setup

| Name                   | US 1 ALT                                                                          |        | Decatur St                                                                         |       | US 1 ALT                                                                            |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Westbound                                                                          |       | Southwestbound                                                                      |        |
| Lane Configuration     |  |        |  |       |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Right | Left                                                                                | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00 | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 1      | 0                                                                                  | 1     | 1                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 75.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |       | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |       | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |       | No                                                                                  |        |

#### Volumes

| Name                                    | US 1 ALT |        | Decatur St |        | US 1 ALT |        |
|-----------------------------------------|----------|--------|------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 652      | 169    | 87         | 212    | 312      | 574    |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000     | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.13     | 2.13   | 1.97       | 2.00   | 2.63     | 2.00   |
| Growth Rate                             | 1.00     | 1.00   | 1.00       | 1.00   | 1.00     | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0          | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 16       | 0      | 0          | 0      | 0        | 8      |
| Diverted Trips [veh/h]                  | 0        | 0      | 0          | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0          | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0          | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0          | 0      | 0        | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0          | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 668      | 169    | 87         | 212    | 312      | 582    |
| Peak Hour Factor                        | 0.9000   | 0.9000 | 0.9000     | 0.9000 | 0.9000   | 0.9000 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000     | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 186      | 47     | 24         | 59     | 87       | 162    |
| Total Analysis Volume [veh/h]           | 742      | 188    | 97         | 236    | 347      | 647    |
| Presence of On-Street Parking           | No       | No     | No         | No     | No       | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0          | 0      | 0        | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0          | 0      | 0        | 0      |
| Pedestrian Volume [ped/h]               | 0        |        | 0          |        | 0        |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0          |        | 0        |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 80             |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 15.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 9.00           |

**Phasing & Timing**

| Control Type                 | Permissive | Unsignalized | Split | Split | ProtectedPermissi | Permissive |
|------------------------------|------------|--------------|-------|-------|-------------------|------------|
| Signal group                 | 6          | 0            | 4     | 0     | 5                 | 2          |
| Auxiliary Signal Groups      |            |              |       |       |                   |            |
| Lead / Lag                   | -          | -            | Lag   | -     | Lead              | -          |
| Minimum Green [s]            | 10         | 0            | 5     | 0     | 4                 | 10         |
| Maximum Green [s]            | 39         | 0            | 15    | 0     | 10                | 54         |
| Amber [s]                    | 5.0        | 0.0          | 4.0   | 0.0   | 4.0               | 5.0        |
| All red [s]                  | 1.0        | 0.0          | 1.0   | 0.0   | 1.0               | 1.0        |
| Split [s]                    | 30         | 0            | 30    | 0     | 30                | 30         |
| Vehicle Extension [s]        | 0.2        | 0.0          | 3.0   | 0.0   | 3.0               | 0.2        |
| Walk [s]                     | 0          | 0            | 0     | 0     | 0                 | 0          |
| Pedestrian Clearance [s]     | 0          | 0            | 0     | 0     | 0                 | 0          |
| Rest In Walk                 | No         |              | No    |       |                   | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 0.0          | 2.0   | 0.0   | 2.0               | 2.0        |
| I2, Clearance Lost Time [s]  | 4.0        | 0.0          | 3.0   | 0.0   | 3.0               | 4.0        |
| Minimum Recall               | No         |              | No    |       | No                | No         |
| Maximum Recall               | Yes        |              | No    |       | No                | Yes        |
| Pedestrian Recall            | No         |              | No    |       | No                | No         |
| Detector Location [ft]       | 0.0        | 0.0          | 0.0   | 0.0   | 0.0               | 0.0        |
| Detector Length [ft]         | 30.0       | 0.0          | 30.0  | 0.0   | 30.0              | 30.0       |
| I, Upstream Filtering Factor | 1.00       | 1.00         | 1.00  | 1.00  | 1.00              | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L     | R     | L     | C    |
|-----------------------------------------|-------|-------|-------|-------|------|
| C, Cycle Length [s]                     | 79    | 79    | 79    | 79    | 79   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 5.00  | 5.00  | 6.00  | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 |
| l2, Clearance Lost Time [s]             | 4.00  | 3.00  | 3.00  | 0.00  | 4.00 |
| g_i, Effective Green Time [s]           | 41    | 14    | 14    | 54    | 54   |
| g / C, Green / Cycle                    | 0.52  | 0.17  | 0.17  | 0.69  | 0.69 |
| (v / s)_i Volume / Saturation Flow Rate | 0.40  | 0.05  | 0.15  | 0.37  | 0.35 |
| s, saturation flow rate [veh/h]         | 1860  | 1775  | 1583  | 929   | 1863 |
| c, Capacity [veh/h]                     | 964   | 308   | 275   | 539   | 1278 |
| d1, Uniform Delay [s]                   | 15.20 | 28.40 | 31.55 | 12.79 | 5.93 |
| k, delay calibration                    | 0.50  | 0.11  | 0.23  | 0.50  | 0.50 |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 |
| d2, Incremental Delay [s]               | 5.91  | 0.58  | 14.54 | 5.81  | 1.43 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 |

**Lane Group Results**

|                                       |        |       |        |        |        |
|---------------------------------------|--------|-------|--------|--------|--------|
| X, volume / capacity                  | 0.77   | 0.31  | 0.86   | 0.64   | 0.51   |
| d, Delay for Lane Group [s/veh]       | 21.12  | 28.98 | 46.09  | 18.60  | 7.36   |
| Lane Group LOS                        | C      | C     | D      | B      | A      |
| Critical Lane Group                   | Yes    | No    | Yes    | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 10.98  | 1.61  | 5.32   | 2.58   | 4.43   |
| 50th-Percentile Queue Length [ft/ln]  | 274.44 | 40.15 | 132.98 | 64.52  | 110.83 |
| 95th-Percentile Queue Length [veh/ln] | 16.41  | 2.89  | 9.10   | 4.65   | 7.89   |
| 95th-Percentile Queue Length [ft/ln]  | 410.28 | 72.28 | 227.54 | 116.13 | 197.16 |



**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |       |      |
|---------------------------------|-------|------|-------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 21.12 | 0.00 | 28.98 | 46.09 | 18.60 | 7.36 |
| Movement LOS                    | C     |      | C     | D     | B     | A    |
| d_A, Approach Delay [s/veh]     | 21.12 |      | 41.11 |       | 11.29 |      |
| Approach LOS                    | C     |      | D     |       | B     |      |
| d_I, Intersection Delay [s/veh] | 19.61 |      |       |       |       |      |
| Intersection LOS                | B     |      |       |       |       |      |
| Intersection V/C                | 0.720 |      |       |       |       |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 14: US 1 Alt/Charles Armentrout St

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 90.0  |
| Analysis Method: | HCM 2010   | Level Of Service:         | F     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.729 |

#### Intersection Setup

| Name                   | US 1 Alt                                                                          |        | US 1 ALT                                                                           |        | Charles L Armentrout                                                                |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1 Alt |        | US 1 ALT |        | Charles L Armentrout |        |
|-----------------------------------------|----------|--------|----------|--------|----------------------|--------|
| Base Volume Input [veh/h]               | 662      | 724    | 623      | 71     | 95                   | 1343   |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000   | 1.0000 | 1.0000               | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.08     | 2.00   | 2.00     | 2.00   | 3.85                 | 2.17   |
| Growth Rate                             | 1.00     | 1.00   | 1.00     | 1.00   | 1.00                 | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0        | 0      | 0                    | 0      |
| Site-Generated Trips [veh/h]            | 12       | 16     | 8        | 0      | 0                    | 7      |
| Diverted Trips [veh/h]                  | 0        | 0      | 0        | 0      | 0                    | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0        | 0      | 0                    | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0        | 0      | 0                    | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0        | 0      | 0                    | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0        | 0      | 0                    | 0      |
| Total Hourly Volume [veh/h]             | 674      | 740    | 631      | 71     | 95                   | 1350   |
| Peak Hour Factor                        | 0.9000   | 0.9000 | 0.9000   | 0.9000 | 0.9000               | 0.9000 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000   | 1.0000 | 1.0000               | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 187      | 206    | 175      | 20     | 26                   | 375    |
| Total Analysis Volume [veh/h]           | 749      | 822    | 701      | 79     | 106                  | 1500   |
| Presence of On-Street Parking           | No       | No     | No       | No     | No                   | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0        | 0      | 0                    | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0        | 0      | 0                    | 0      |
| Pedestrian Volume [ped/h]               | 0        |        | 0        |        | 0                    |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0        |        | 0                    |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | ProtectedPermissi | Permissive | Permissive | Permissive | Permissive | Unsignalized |
|------------------------------|-------------------|------------|------------|------------|------------|--------------|
| Signal group                 | 5                 | 2          | 6          | 0          | 3          | 3            |
| Auxiliary Signal Groups      |                   |            |            |            |            |              |
| Lead / Lag                   | Lead              | -          | -          | -          | Lead       | -            |
| Minimum Green [s]            | 5                 | 5          | 5          | 0          | 5          | 5            |
| Maximum Green [s]            | 30                | 30         | 30         | 0          | 30         | 30           |
| Amber [s]                    | 3.0               | 3.0        | 3.0        | 0.0        | 3.0        | 3.0          |
| All red [s]                  | 1.0               | 1.0        | 1.0        | 0.0        | 1.0        | 1.0          |
| Split [s]                    | 42                | 81         | 39         | 0          | 39         | 39           |
| Vehicle Extension [s]        | 3.0               | 3.0        | 3.0        | 0.0        | 3.0        | 3.0          |
| Walk [s]                     | 0                 | 5          | 5          | 0          | 5          | 5            |
| Pedestrian Clearance [s]     | 0                 | 10         | 10         | 0          | 10         | 10           |
| Rest In Walk                 |                   | No         | No         |            | No         |              |
| I1, Start-Up Lost Time [s]   | 2.0               | 2.0        | 2.0        | 0.0        | 2.0        | 2.0          |
| I2, Clearance Lost Time [s]  | 2.0               | 2.0        | 2.0        | 0.0        | 2.0        | 2.0          |
| Minimum Recall               | No                | No         | No         |            | No         |              |
| Maximum Recall               | No                | No         | No         |            | No         |              |
| Pedestrian Recall            | No                | No         | No         |            | No         |              |
| Detector Location [ft]       | 0.0               | 0.0        | 0.0        | 0.0        | 0.0        | 0.0          |
| Detector Length [ft]         | 0.0               | 0.0        | 0.0        | 0.0        | 0.0        | 0.0          |
| I, Upstream Filtering Factor | 1.00              | 1.00       | 1.00       | 1.00       | 1.00       | 1.00         |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C      | R     | L     |
|-----------------------------------------|-------|-------|--------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120    | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00  | 4.00   | 4.00  | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 2.00  | 2.00   | 2.00  | 2.00  |
| g_i, Effective Green Time [s]           | 77    | 77    | 35     | 35    | 35    |
| g / C, Green / Cycle                    | 0.64  | 0.64  | 0.29   | 0.29  | 0.29  |
| (v / s)_i Volume / Saturation Flow Rate | 0.59  | 0.44  | 0.38   | 0.05  | 0.06  |
| s, saturation flow rate [veh/h]         | 1277  | 1863  | 1863   | 1583  | 1743  |
| c, Capacity [veh/h]                     | 693   | 1195  | 543    | 462   | 508   |
| d1, Uniform Delay [s]                   | 35.83 | 13.79 | 42.50  | 31.69 | 32.05 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50   | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 58.23 | 3.24  | 143.98 | 0.80  | 0.93  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |         |       |        |
|---------------------------------------|--------|--------|---------|-------|--------|
| X, volume / capacity                  | 1.08   | 0.69   | 1.29    | 0.17  | 0.21   |
| d, Delay for Lane Group [s/veh]       | 94.06  | 17.03  | 186.48  | 32.49 | 32.98  |
| Lane Group LOS                        | F      | B      | F       | C     | C      |
| Critical Lane Group                   | Yes    | No     | Yes     | No    | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 21.51  | 14.41  | 37.63   | 1.83  | 2.50   |
| 50th-Percentile Queue Length [ft/ln]  | 537.74 | 360.15 | 940.66  | 45.66 | 62.41  |
| 95th-Percentile Queue Length [veh/ln] | 31.00  | 20.63  | 55.14   | 3.29  | 4.49   |
| 95th-Percentile Queue Length [ft/ln]  | 774.91 | 515.77 | 1378.54 | 82.19 | 112.33 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |        |       |       |      |
|---------------------------------|-------|-------|--------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 94.06 | 17.03 | 186.48 | 32.49 | 32.98 | 0.00 |
| Movement LOS                    | F     | B     | F      | C     | C     |      |
| d_A, Approach Delay [s/veh]     | 53.76 |       | 170.88 |       | 32.98 |      |
| Approach LOS                    | D     |       | F      |       | C     |      |
| d_I, Intersection Delay [s/veh] | 90.04 |       |        |       |       |      |
| Intersection LOS                | F     |       |        |       |       |      |
| Intersection V/C                | 0.729 |       |        |       |       |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 2 | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 81s

SG: 3 39s

SG: 103 15s

SG: 5 42s

SG: 6 39s

SG: 106 15s

### Intersection Level Of Service Report

#### Intersection 15: US 1/Gallatin St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 3.6  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.283

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Gallatin St.                                                                        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 0.00                                                                                |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | No                                                                                  |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Gallatin St. |        |
|-----------------------------------------|--------|--------|--------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 23     | 767    | 449    | 45     | 10           | 10     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.11   | 2.05   | 0.00   | 0.00         | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00         | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0      | 12     | 7      | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0            | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 23     | 779    | 456    | 45     | 10           | 10     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000       | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 6      | 216    | 127    | 13     | 3            | 3      |
| Total Analysis Volume [veh/h]           | 26     | 866    | 507    | 50     | 10           | 10     |
| Presence of On-Street Parking           | No     | No     | No     | No     | No           | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0            | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0            | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 4      |        | 0            |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0            |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 84.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 6.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
|------------------------------|------------|------------|------------|------------|------------|------------|
| Signal group                 | 6          | 6          | 2          | 2          | 4          | 0          |
| Auxiliary Signal Groups      |            |            |            |            |            |            |
| Lead / Lag                   | Lag        | -          | -          | -          | Lead       | -          |
| Minimum Green [s]            | 4          | 4          | 4          | 4          | 5          | 0          |
| Maximum Green [s]            | 86         | 86         | 86         | 86         | 30         | 0          |
| Amber [s]                    | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 0.0        |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0        | 0.0        |
| Split [s]                    | 75         | 75         | 75         | 75         | 15         | 0          |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 0.0        |
| Walk [s]                     | 0          | 0          | 20         | 20         | 5          | 0          |
| Pedestrian Clearance [s]     | 0          | 0          | 10         | 10         | 10         | 0          |
| Rest In Walk                 |            |            |            |            |            |            |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0        | 0.0        |
| I2, Clearance Lost Time [s]  | 2.0        | 2.0        | 2.0        | 2.0        | 2.0        | 0.0        |
| Minimum Recall               |            | No         | No         |            | No         |            |
| Maximum Recall               |            | Yes        | No         |            | No         |            |
| Pedestrian Recall            |            | No         | No         |            | No         |            |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |    |
|--------------------------|----|
| Pedestrian Signal Group  | 8  |
| Pedestrian Walk [s]      | 20 |
| Pedestrian Clearance [s] | 10 |



**Lane Group Calculations**

| Lane Group                              | C    | C    | C    | C    | C     |
|-----------------------------------------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 4.00 | 4.00 | 4.00 | 4.00 | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00 | 2.00 | 2.00 | 2.00 | 2.00  |
| g_i, Effective Green Time [s]           | 100  | 100  | 100  | 100  | 2     |
| g / C, Green / Cycle                    | 0.83 | 0.83 | 0.83 | 0.83 | 0.02  |
| (v / s)_i Volume / Saturation Flow Rate | 0.26 | 0.26 | 0.15 | 0.15 | 0.01  |
| s, saturation flow rate [veh/h]         | 1778 | 1693 | 1862 | 1805 | 1707  |
| c, Capacity [veh/h]                     | 1504 | 1403 | 1542 | 1495 | 36    |
| d1, Uniform Delay [s]                   | 2.35 | 2.38 | 2.08 | 2.09 | 58.22 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 0.52 | 0.58 | 0.26 | 0.28 | 12.41 |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |       |       |       |       |
|---------------------------------------|-------|-------|-------|-------|-------|
| X, volume / capacity                  | 0.30  | 0.31  | 0.18  | 0.19  | 0.55  |
| d, Delay for Lane Group [s/veh]       | 2.87  | 2.96  | 2.34  | 2.37  | 70.63 |
| Lane Group LOS                        | A     | A     | A     | A     | E     |
| Critical Lane Group                   | Yes   | No    | No    | No    | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 1.93  | 1.88  | 1.03  | 1.04  | 0.75  |
| 50th-Percentile Queue Length [ft/ln]  | 48.14 | 46.88 | 25.84 | 26.07 | 18.87 |
| 95th-Percentile Queue Length [veh/ln] | 3.47  | 3.38  | 1.86  | 1.88  | 1.36  |
| 95th-Percentile Queue Length [ft/ln]  | 86.64 | 84.39 | 46.51 | 46.93 | 33.96 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |       |       |
|---------------------------------|-------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 2.87  | 2.92 | 2.35 | 2.37 | 70.63 | 70.63 |
| Movement LOS                    | A     | A    | A    | A    | E     | E     |
| d_A, Approach Delay [s/veh]     | 2.91  |      | 2.36 |      | 70.63 |       |
| Approach LOS                    | A     |      | A    |      | E     |       |
| d_I, Intersection Delay [s/veh] | 3.62  |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |       |       |
| Intersection V/C                | 0.283 |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 75s

SG: 4 15s

SG: 8 30s

SG: 6 75s

### Intersection Level Of Service Report Intersection 16: US 1/Farragut St

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 10.3  
Level Of Service: B  
Volume to Capacity (v/c): 0.565

#### Intersection Setup

| Name                   | US 1                                                                              |        | Farragut                                                                           |        | US 1                                                                                |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Southbound                                                                        |        | Eastbound                                                                          |        | Northeastbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Right  | Left                                                                                | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 25.00                                                                              |        | 35.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | Farragut |        | US 1   |        |
|-----------------------------------------|--------|--------|----------|--------|--------|--------|
| Base Volume Input [veh/h]               | 445    | 9      | 47       | 36     | 12     | 757    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.97   | 0.00   | 0.00     | 0.00   | 0.00   | 2.11   |
| Growth Rate                             | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0        | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 7      | 0      | 0        | 0      | 0      | 12     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0        | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0        | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0        | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0        | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0        | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 452    | 9      | 47       | 36     | 12     | 769    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 126    | 3      | 13       | 10     | 3      | 214    |
| Total Analysis Volume [veh/h]           | 502    | 10     | 52       | 40     | 13     | 854    |
| Presence of On-Street Parking           | No     | No     | No       | No     | No     | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0        | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0        | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0        |        | 0      |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0        |        | 0      |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 78.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Split | Split | Permissive | Permissive |
|------------------------------|------------|------------|-------|-------|------------|------------|
| Signal group                 | 6          | 6          | 4     | 4     | 2          | 2          |
| Auxiliary Signal Groups      |            |            |       |       |            |            |
| Lead / Lag                   | -          | -          | Lead  | -     | Lag        | -          |
| Minimum Green [s]            | 20         | 20         | 20    | 20    | 20         | 20         |
| Maximum Green [s]            | 89         | 89         | 20    | 20    | 89         | 89         |
| Amber [s]                    | 5.0        | 5.0        | 4.0   | 4.0   | 5.0        | 5.0        |
| All red [s]                  | 1.0        | 1.0        | 1.0   | 1.0   | 1.0        | 1.0        |
| Split [s]                    | 95         | 95         | 25    | 25    | 95         | 95         |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0   | 3.0   | 3.0        | 3.0        |
| Walk [s]                     | 0          | 0          | 0     | 0     | 0          | 0          |
| Pedestrian Clearance [s]     | 0          | 0          | 0     | 0     | 0          | 0          |
| Rest In Walk                 | No         |            | No    |       |            | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0   | 2.0   | 2.0        | 2.0        |
| I2, Clearance Lost Time [s]  | 4.0        | 4.0        | 3.0   | 3.0   | 4.0        | 4.0        |
| Minimum Recall               | No         |            | No    |       |            | No         |
| Maximum Recall               | Yes        |            | Yes   |       |            | Yes        |
| Pedestrian Recall            | No         |            | No    |       |            | No         |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0   | 0.0   | 0.0        | 0.0        |
| Detector Length [ft]         | 50.0       | 50.0       | 0.0   | 0.0   | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00  | 1.00  | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C     | C    |
|-----------------------------------------|------|------|-------|------|
| C, Cycle Length [s]                     | 120  | 120  | 120   | 120  |
| L, Total Lost Time per Cycle [s]        | 6.00 | 6.00 | 5.00  | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00  | 2.00 |
| l2, Clearance Lost Time [s]             | 4.00 | 4.00 | 3.00  | 4.00 |
| g_i, Effective Green Time [s]           | 89   | 89   | 20    | 89   |
| g / C, Green / Cycle                    | 0.74 | 0.74 | 0.17  | 0.74 |
| (v / s)_i Volume / Saturation Flow Rate | 0.14 | 0.14 | 0.05  | 0.47 |
| s, saturation flow rate [veh/h]         | 1863 | 1851 | 1719  | 1848 |
| c, Capacity [veh/h]                     | 1382 | 1373 | 287   | 1401 |
| d1, Uniform Delay [s]                   | 4.64 | 4.65 | 44.02 | 7.50 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50  | 0.50 |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00  | 1.00 |
| d2, Incremental Delay [s]               | 0.30 | 0.30 | 2.94  | 2.06 |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00  | 0.00 |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00  | 1.00 |
| PF, progression factor                  | 1.00 | 1.00 | 1.00  | 1.00 |

**Lane Group Results**

|                                       |       |       |        |        |
|---------------------------------------|-------|-------|--------|--------|
| X, volume / capacity                  | 0.19  | 0.19  | 0.32   | 0.62   |
| d, Delay for Lane Group [s/veh]       | 4.94  | 4.95  | 46.96  | 9.56   |
| Lane Group LOS                        | A     | A     | D      | A      |
| Critical Lane Group                   | No    | No    | Yes    | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 1.81  | 1.82  | 2.68   | 9.73   |
| 50th-Percentile Queue Length [ft/ln]  | 45.33 | 45.40 | 66.89  | 243.28 |
| 95th-Percentile Queue Length [veh/ln] | 3.26  | 3.27  | 4.82   | 14.85  |
| 95th-Percentile Queue Length [ft/ln]  | 81.59 | 81.72 | 120.41 | 371.18 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |      |      |
|---------------------------------|-------|------|-------|-------|------|------|
| d_M, Delay for Movement [s/veh] | 4.94  | 4.95 | 46.96 | 46.96 | 9.56 | 9.56 |
| Movement LOS                    | A     | A    | D     | D     | A    | A    |
| d_A, Approach Delay [s/veh]     | 4.94  |      | 46.96 |       | 9.56 |      |
| Approach LOS                    | A     |      | D     |       | A    |      |
| d_I, Intersection Delay [s/veh] | 10.29 |      |       |       |      |      |
| Intersection LOS                | B     |      |       |       |      |      |
| Intersection V/C                | 0.565 |      |       |       |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 95s

SG: 4 25s

SG: 6 95s

### Intersection Level Of Service Report

#### Intersection 17: US 1/43rd Ave

Control Type: Two-way stop  
 Analysis Method: HCM 6th Edition  
 Analysis Period: 15 minutes

Delay (sec / veh): 21.6  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.099

#### Intersection Setup

| Name                   | US 1           |        | US 1           |        |                |        |
|------------------------|----------------|--------|----------------|--------|----------------|--------|
| Approach               | Northeastbound |        | Southwestbound |        | Southeastbound |        |
| Lane Configuration     |                |        |                |        |                |        |
| Turning Movement       | Left           | Thru   | Thru           | Right  | Left           | Right  |
| Lane Width [ft]        | 12.00          | 12.00  | 12.00          | 12.00  | 12.00          | 12.00  |
| No. of Lanes in Pocket | 1              | 0      | 0              | 0      | 0              | 0      |
| Pocket Length [ft]     | 150.00         | 100.00 | 100.00         | 100.00 | 100.00         | 100.00 |
| Speed [mph]            | 35.00          |        | 35.00          |        | 30.00          |        |
| Grade [%]              | 0.00           |        | 0.00           |        | 0.00           |        |
| Crosswalk              | Yes            |        | Yes            |        | Yes            |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 50     | 743    | 467    | 16     | 24     | 70     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 12     | 7      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 50     | 755    | 474    | 16     | 24     | 70     |
| Peak Hour Factor                        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 13     | 189    | 119    | 4      | 6      | 18     |
| Total Analysis Volume [veh/h]           | 50     | 755    | 474    | 16     | 24     | 70     |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0      |        |



**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |       |       |
|---------------------------------------|------|------|------|------|-------|-------|
| V/C, Movement V/C Ratio               | 0.05 | 0.01 | 0.00 | 0.00 | 0.10  | 0.09  |
| d_M, Delay for Movement [s/veh]       | 8.53 | 0.00 | 0.00 | 0.00 | 21.56 | 11.50 |
| Movement LOS                          | A    | A    | A    | A    | C     | B     |
| 95th-Percentile Queue Length [veh/ln] | 0.15 | 0.00 | 0.00 | 0.00 | 0.70  | 0.70  |
| 95th-Percentile Queue Length [ft/ln]  | 3.67 | 0.00 | 0.00 | 0.00 | 17.52 | 17.52 |
| d_A, Approach Delay [s/veh]           | 0.53 |      | 0.00 |      | 14.07 |       |
| Approach LOS                          | A    |      | A    |      | B     |       |
| d_I, Intersection Delay [s/veh]       | 1.26 |      |      |      |       |       |
| Intersection LOS                      | C    |      |      |      |       |       |

### Intersection Level Of Service Report

#### Intersection 18: US 1/42nd Place/Crittendon Street

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 55.0  |
| Analysis Method: | HCM 2010   | Level Of Service:         | E     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.892 |

#### Intersection Setup

| Name                   | 42nd Pl                                                                           |        |        | Crittenden St                                                                     |        |        | US 1                                                                                |        |        | US 1                                                                                |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Southbound                                                                        |        |        | Eastbound                                                                         |        |        | Northeastbound                                                                      |        |        | Southwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Right  | Right2 | Left                                                                              | Thru   | Right  | Left2                                                                               | Left   | Thru   | Thru                                                                                | Right  | Right2 |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 150.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 25.00                                                                             |        |        | 25.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

#### Volumes

| Name                                    | 42nd Pl |        |        | Crittenden St |        |        | US 1   |        |        | US 1   |        |        |
|-----------------------------------------|---------|--------|--------|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 5       | 16     | 0      | 0             | 38     | 355    | 346    | 50     | 778    | 518    | 30     | 5      |
| Base Volume Adjustment Factor           | 1.0000  | 1.0000 | 1.0000 | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00    | 0.00   | 0.00   | 0.00          | 0.00   | 2.00   | 2.14   | 0.00   | 2.17   | 2.05   | 0.00   | 0.00   |
| Growth Rate                             | 1.00    | 1.00   | 1.00   | 1.00          | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0       | 0      | 0      | 0             | 0      | 7      | 12     | 0      | 12     | 7      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 5       | 16     | 0      | 0             | 38     | 362    | 358    | 50     | 790    | 525    | 30     | 5      |
| Peak Hour Factor                        | 0.9000  | 0.9000 | 0.9000 | 1.0000        | 0.9000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000  | 1.0000 | 1.0000 | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1       | 4      | 0      | 0             | 11     | 101    | 90     | 14     | 219    | 146    | 8      | 1      |
| Total Analysis Volume [veh/h]           | 6       | 18     | 0      | 0             | 42     | 402    | 358    | 56     | 878    | 583    | 33     | 6      |
| Presence of On-Street Parking           | No      |        | No     | No            |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0       |        |        | 0             |        |        | 0      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0       |        |        | 0             |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 42.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Signal group                 | 4     | 4     | 4     | 0     | 3     | 3     | 0     | 6     | 6     | 2     | 6     | 6     |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |       |       |       |       |
| Lead / Lag                   | Lag   | -     | -     | -     | -     | -     | -     | Lag   | -     | -     | -     | -     |
| Minimum Green [s]            | 5     | 5     | 5     | 0     | 5     | 5     | 0     | 20    | 20    | 20    | 20    | 20    |
| Maximum Green [s]            | 19    | 19    | 19    | 0     | 25    | 25    | 0     | 60    | 60    | 60    | 60    | 60    |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 0.0   | 4.0   | 4.0   | 0.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 0.0   | 1.0   | 1.0   | 0.0   | 4.0   | 4.0   | 1.0   | 4.0   | 4.0   |
| Split [s]                    | 24    | 24    | 24    | 0     | 30    | 30    | 0     | 66    | 66    | 66    | 66    | 66    |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Rest In Walk                 | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 0.0   | 7.0   | 7.0   | 6.0   | 7.0   | 7.0   |
| Minimum Recall               | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| Maximum Recall               | No    |       |       |       | No    |       |       |       | Yes   | Yes   |       |       |
| Pedestrian Recall            | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0  | 50.0  | 50.0  | 0.0   | 50.0  | 50.0  | 0.0   | 50.0  | 50.0  | 50.0  | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C      | L     | C     | C     | C     |
|-----------------------------------------|-------|--------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120    | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00   | 9.00  | 9.00  | 8.00  | 8.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00   | 2.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00   | 7.00  | 7.00  | 6.00  | 6.00  |
| g_i, Effective Green Time [s]           | 3     | 25     | 73    | 73    | 74    | 74    |
| g / C, Green / Cycle                    | 0.02  | 0.21   | 0.61  | 0.61  | 0.62  | 0.62  |
| (v / s)_i Volume / Saturation Flow Rate | 0.01  | 0.27   | 0.52  | 0.25  | 0.17  | 0.17  |
| s, saturation flow rate [veh/h]         | 1660  | 1638   | 800   | 3541  | 1862  | 1821  |
| c, Capacity [veh/h]                     | 40    | 341    | 467   | 2158  | 1150  | 1125  |
| d1, Uniform Delay [s]                   | 58.00 | 47.51  | 29.93 | 12.18 | 10.53 | 10.58 |
| k, delay calibration                    | 0.11  | 0.50   | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 13.72 | 155.40 | 21.13 | 0.57  | 0.58  | 0.61  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |        |        |
|---------------------------------------|-------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.60  | 1.30   | 0.89   | 0.41   | 0.27   | 0.28   |
| d, Delay for Lane Group [s/veh]       | 71.72 | 202.91 | 51.06  | 12.75  | 11.11  | 11.19  |
| Lane Group LOS                        | E     | F      | D      | B      | B      | B      |
| Critical Lane Group                   | Yes   | Yes    | Yes    | No     | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 0.88  | 24.96  | 14.10  | 5.95   | 3.78   | 3.80   |
| 50th-Percentile Queue Length [ft/ln]  | 22.00 | 623.98 | 352.38 | 148.68 | 94.39  | 94.93  |
| 95th-Percentile Queue Length [veh/ln] | 1.58  | 37.70  | 20.25  | 9.95   | 6.80   | 6.83   |
| 95th-Percentile Queue Length [ft/ln]  | 39.60 | 942.48 | 506.31 | 248.66 | 169.90 | 170.87 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |        |        |        |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 71.72 | 71.72 | 71.72 | 0.00   | 202.91 | 202.91 | 51.06 | 51.06 | 12.75 | 11.14 | 11.19 | 11.19 |
| Movement LOS                    | E     | E     | E     |        | F      | F      | D     | D     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 71.72 |       |       | 202.91 |        |        | 25.02 |       |       | 11.15 |       |       |
| Approach LOS                    | E     |       |       | F      |        |        | C     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 55.03 |       |       |        |        |        |       |       |       |       |       |       |
| Intersection LOS                | E     |       |       |        |        |        |       |       |       |       |       |       |
| Intersection V/C                | 0.892 |       |       |        |        |        |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**  
**Intersection 19: US 1/41st Place/Charles Armentrout Dr**

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 33.0  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.904 |

**Intersection Setup**

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Charles L Armentrout                                                                |        |        | 41st                                                                                |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 200.00                                                                            | 100.00 | 200.00 | 200.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 43.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                    | US 1   |        |        | US 1   |        |        | Charles L Armentrout |        |        | 41st   |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|----------------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 1      | 675    | 563    | 592    | 356    | 2      | 271                  | 3      | 474    | 2      | 2      | 2      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.00   | 2.38   | 2.14   | 2.00   | 0.00   | 2.00                 | 0.00   | 2.21   | 0.00   | 0.00   | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00                 | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 12     | 0      | 7      | 7      | 0      | 0                    | 0      | 12     | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 1      | 687    | 563    | 599    | 363    | 2      | 271                  | 3      | 486    | 2      | 2      | 2      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000               | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0      | 191    | 156    | 166    | 101    | 1      | 75                   | 1      | 135    | 1      | 1      | 1      |
| Total Analysis Volume [veh/h]           | 1      | 763    | 626    | 666    | 403    | 2      | 301                  | 3      | 540    | 2      | 2      | 2      |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No                   |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 4      |        |        | 0      |        |        | 0                    |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0                    |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 42.0                            |
| Offset Reference          | LagEnd                          |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Overlap | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 6       | 6       | 6       | 5        | 2       | 2       | 8       | 8       | 2       | 4       | 4       | 4       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |         |         | 2,5     |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 20      | 5        | 20      | 20      | 8       | 8       | 20      | 8       | 8       | 8       |
| Maximum Green [s]            | 49      | 49      | 49      | 25       | 78      | 78      | 30      | 30      | 78      | 30      | 30      | 30      |
| Amber [s]                    | 5.0     | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     | 4.0     | 4.0     | 5.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0     | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     | 2.0     | 2.0     | 1.0     | 2.0     | 2.0     | 2.0     |
| Split [s]                    | 54      | 54      | 54      | 30       | 84      | 84      | 36      | 36      | 84      | 36      | 36      | 36      |
| Vehicle Extension [s]        | 6.0     | 6.0     | 6.0     | 3.0      | 6.0     | 6.0     | 3.0     | 3.0     | 6.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |          | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0     | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| Minimum Recall               |         | No      |         | No       | No      |         |         | No      | No      |         | No      |         |
| Maximum Recall               |         | Yes     |         | No       | Yes     |         |         | No      | Yes     |         | No      |         |
| Pedestrian Recall            |         | No      |         | No       | No      |         |         | No      | No      |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 50.0    | 50.0    | 50.0    | 50.0     | 50.0    | 50.0    | 50.0    | 50.0    | 0.0     | 50.0    | 50.0    | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C    | C    | C     | R    | C     |
|-----------------------------------------|-------|-------|-------|-------|------|------|-------|------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   | 120  | 120  | 120   | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00  | 6.00  | 6.00  | 6.00 | 6.00 | 6.00  | 5.50 | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 2.00  | 0.00 | 2.00  |
| l2, Clearance Lost Time [s]             | 4.00  | 4.00  | 4.00  | 0.00  | 4.00 | 4.00 | 4.00  | 0.00 | 4.00  |
| g_i, Effective Green Time [s]           | 51    | 51    | 51    | 81    | 81   | 81   | 27    | 81   | 27    |
| g / C, Green / Cycle                    | 0.43  | 0.43  | 0.43  | 0.68  | 0.68 | 0.68 | 0.22  | 0.68 | 0.22  |
| (v / s)_i Volume / Saturation Flow Rate | 0.00  | 0.22  | 0.40  | 0.62  | 0.11 | 0.11 | 0.21  | 0.34 | 0.00  |
| s, saturation flow rate [veh/h]         | 996   | 3547  | 1577  | 1069  | 1863 | 1860 | 1462  | 1580 | 1870  |
| c, Capacity [veh/h]                     | 427   | 1512  | 673   | 701   | 1260 | 1258 | 387   | 1069 | 458   |
| d1, Uniform Delay [s]                   | 23.98 | 25.16 | 32.74 | 20.35 | 7.05 | 7.05 | 45.38 | 9.55 | 36.29 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50 | 0.50 | 0.29  | 0.50 | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 0.01  | 1.21  | 21.34 | 23.75 | 0.27 | 0.27 | 9.09  | 1.71 | 0.01  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |       |       |        |        |       |
|---------------------------------------|-------|--------|--------|--------|-------|-------|--------|--------|-------|
| X, volume / capacity                  | 0.00  | 0.50   | 0.93   | 0.95   | 0.16  | 0.16  | 0.79   | 0.51   | 0.01  |
| d, Delay for Lane Group [s/veh]       | 23.99 | 26.36  | 54.07  | 44.10  | 7.33  | 7.33  | 54.47  | 11.26  | 36.30 |
| Lane Group LOS                        | C     | C      | D      | D      | A     | A     | D      | B      | D     |
| Critical Lane Group                   | No    | No     | Yes    | Yes    | No    | No    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.02  | 7.86   | 20.22  | 12.81  | 1.84  | 1.84  | 9.88   | 7.17   | 0.14  |
| 50th-Percentile Queue Length [ft/ln]  | 0.47  | 196.43 | 505.57 | 320.35 | 46.02 | 45.95 | 247.00 | 179.34 | 3.53  |
| 95th-Percentile Queue Length [veh/ln] | 0.03  | 12.45  | 27.60  | 18.68  | 3.31  | 3.31  | 15.03  | 11.57  | 0.25  |
| 95th-Percentile Queue Length [ft/ln]  | 0.84  | 311.36 | 689.95 | 467.12 | 82.84 | 82.71 | 375.87 | 289.15 | 6.36  |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 23.99 | 26.36 | 54.07 | 44.10 | 7.33 | 7.33 | 54.47 | 54.47 | 11.26 | 36.30 | 36.30 | 36.30 |
| Movement LOS                    | C     | C     | D     | D     | A    | A    | D     | D     | B     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 38.84 |       |       | 30.19 |      |      | 26.82 |       |       | 36.30 |       |       |
| Approach LOS                    | D     |       |       | C     |      |      | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 32.98 |       |       |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.904 |       |       |       |      |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 20: MD 410/Toledo Terrace

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 46.1  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.758

#### Intersection Setup

| Name                   |                                                                                   |        |        | Toledo Terrace                                                                    |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 500.00                                                                              | 100.00 | 900.00 | 175.00                                                                              | 100.00 | 175.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 50.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Toledo Terrace |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 99     | 32     | 93     | 127            | 19     | 283    | 387    | 1306   | 145    | 81     | 998    | 155    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.44   | 0.00   | 2.50   | 2.38           | 0.00   | 1.96   | 2.07   | 2.00   | 1.92   | 2.00   | 2.05   | 3.85   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00           | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 22     | 0      | 0      | 0              | 0      | 0      | 0      | 24     | 41     | 0      | 13     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 121    | 32     | 93     | 127            | 19     | 283    | 387    | 1330   | 186    | 81     | 1011   | 155    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000         | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 34     | 9      | 26     | 35             | 5      | 79     | 108    | 369    | 52     | 23     | 281    | 43     |
| Total Analysis Volume [veh/h]           | 134    | 36     | 103    | 141            | 21     | 314    | 430    | 1478   | 207    | 90     | 1123   | 172    |
| Presence of On-Street Parking           | No     |        | No     | No             |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 4      |        |        | 2              |        |        | 1      |        |        | 5      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0              |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 66.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|---------|---------|
| Signal group                 | 8       | 8       | 8       | 4       | 4       | 4       | 1        | 6       | 6       | 2       | 2       | 2       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lead     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 8       | 8       | 8       | 8       | 8       | 8       | 5        | 20      | 20      | 20      | 20      | 20      |
| Maximum Green [s]            | 39      | 39      | 39      | 39      | 39      | 39      | 31       | 99      | 99      | 63      | 63      | 63      |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0      | 4.5     | 4.5     | 4.5     | 4.5     | 4.5     |
| All red [s]                  | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 1.0      | 1.5     | 1.5     | 1.5     | 1.5     | 1.5     |
| Split [s]                    | 45      | 45      | 45      | 45      | 45      | 45      | 36       | 105     | 105     | 69      | 69      | 69      |
| Vehicle Extension [s]        | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0      | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         |         | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | Yes     |         |         | Yes     |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L      | C     | L     | C     | L     | C     | C     | L      | C     | C     |
|-----------------------------------------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| C, Cycle Length [s]                     | 150    | 150   | 150   | 150   | 150   | 150   | 150   | 150    | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 6.00   | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00   | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00   | 0.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 2.00   | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 4.00   | 4.00  | 4.00  | 4.00  | 0.00  | 4.00  | 4.00  | 4.00   | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 39     | 39    | 39    | 39    | 99    | 99    | 99    | 65     | 65    | 65    |
| g / C, Green / Cycle                    | 0.26   | 0.26  | 0.26  | 0.26  | 0.66  | 0.66  | 0.66  | 0.44   | 0.44  | 0.44  |
| (v / s)_i Volume / Saturation Flow Rate | 0.13   | 0.08  | 0.11  | 0.21  | 0.50  | 0.45  | 0.47  | 0.31   | 0.35  | 0.36  |
| s, saturation flow rate [veh/h]         | 1036   | 1673  | 1236  | 1629  | 856   | 1863  | 1784  | 291    | 1862  | 1776  |
| c, Capacity [veh/h]                     | 108    | 435   | 272   | 423   | 503   | 1229  | 1177  | 83     | 810   | 773   |
| d1, Uniform Delay [s]                   | 72.59  | 44.79 | 56.76 | 51.71 | 40.14 | 15.83 | 16.43 | 71.20  | 37.06 | 37.24 |
| k, delay calibration                    | 0.11   | 0.11  | 0.11  | 0.28  | 0.50  | 0.50  | 0.50  | 0.50   | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 124.66 | 0.42  | 1.53  | 8.25  | 16.82 | 3.12  | 3.74  | 123.61 | 8.82  | 9.59  |
| d3, Initial Queue Delay [s]             | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| PF, progression factor                  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |        |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 1.24   | 0.32   | 0.52   | 0.79   | 0.86   | 0.69   | 0.72   | 1.08   | 0.81   | 0.82   |
| d, Delay for Lane Group [s/veh]       | 197.25 | 45.21  | 58.29  | 59.96  | 56.96  | 18.95  | 20.17  | 194.81 | 45.88  | 46.83  |
| Lane Group LOS                        | F      | D      | E      | E      | E      | B      | C      | F      | D      | D      |
| Critical Lane Group                   | No     | No     | No     | Yes    | Yes    | No     | No     | No     | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 7.93   | 4.29   | 5.09   | 12.76  | 8.24   | 17.02  | 17.78  | 6.01   | 22.38  | 21.78  |
| 50th-Percentile Queue Length [ft/ln]  | 198.14 | 107.19 | 127.17 | 318.95 | 205.96 | 425.57 | 444.62 | 150.30 | 559.47 | 544.49 |
| 95th-Percentile Queue Length [veh/ln] | 13.86  | 7.68   | 8.79   | 18.62  | 12.95  | 23.79  | 24.70  | 10.51  | 30.14  | 29.43  |
| 95th-Percentile Queue Length [ft/ln]  | 346.41 | 192.09 | 219.64 | 465.40 | 323.64 | 594.72 | 617.52 | 262.82 | 753.42 | 735.83 |

**Movement, Approach, & Intersection Results**

|                                 |        |       |       |       |       |       |       |       |       |        |       |       |
|---------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 197.25 | 45.21 | 45.21 | 58.29 | 59.96 | 59.96 | 56.96 | 19.47 | 20.17 | 194.81 | 46.27 | 46.83 |
| Movement LOS                    | F      | D     | D     | E     | E     | E     | E     | B     | C     | F      | D     | D     |
| d_A, Approach Delay [s/veh]     | 119.84 |       |       | 59.46 |       |       | 27.16 |       |       | 55.99  |       |       |
| Approach LOS                    | F      |       |       | E     |       |       | C     |       |       | E      |       |       |
| d_I, Intersection Delay [s/veh] | 46.13  |       |       |       |       |       |       |       |       |        |       |       |
| Intersection LOS                | D      |       |       |       |       |       |       |       |       |        |       |       |
| Intersection V/C                | 0.758  |       |       |       |       |       |       |       |       |        |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 21: MD 410/Editors Park Dr

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 8.4   |
| Analysis Method: | HCM 2010   | Level Of Service:         | A     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.777 |

#### Intersection Setup

| Name                   | Editors Park Dr                                                                   |        | MD 410                                                                             |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        | Eastbound                                                                          |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |  |        |  |        |        |
| Turning Movement       | Left                                                                              | Right  | Thru                                                                               | Right  | U-turn                                                                              | Left   | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 200.00 | 150.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 45.00                                                                              |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Editors Park Dr |        | MD 410 |        | MD 410 |        |        |
|-----------------------------------------|-----------------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 64              | 67     | 1460   | 109    | 1      | 35     | 1282   |
| Base Volume Adjustment Factor           | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85            | 0.00   | 2.00   | 1.64   | 0.00   | 1.89   | 2.05   |
| Growth Rate                             | 1.00            | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0               | 64     | 24     | 0      | 0      | 121    | 13     |
| Diverted Trips [veh/h]                  | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 64              | 131    | 1484   | 109    | 1      | 156    | 1295   |
| Peak Hour Factor                        | 0.9000          | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 18              | 36     | 412    | 30     | 0      | 43     | 360    |
| Total Analysis Volume [veh/h]           | 71              | 146    | 1649   | 121    | 1      | 173    | 1439   |
| Presence of On-Street Parking           | No              | No     | No     | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0               |        | 0      |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0               |        | 0      |        | 0      |        |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
|------------------------------|------------|------------|------------|------------|------------|------------|------------|
| Signal group                 | 5          | 0          | 6          | 0          | 0          | 0          | 2          |
| Auxiliary Signal Groups      |            |            |            |            |            |            |            |
| Lead / Lag                   | Lead       | -          | -          | -          | -          | -          | -          |
| Minimum Green [s]            | 5          | 0          | 5          | 0          | 0          | 0          | 5          |
| Maximum Green [s]            | 30         | 0          | 30         | 0          | 0          | 0          | 30         |
| Amber [s]                    | 3.0        | 0.0        | 3.0        | 0.0        | 0.0        | 0.0        | 3.0        |
| All red [s]                  | 1.0        | 0.0        | 1.0        | 0.0        | 0.0        | 0.0        | 1.0        |
| Split [s]                    | 74         | 0          | 46         | 0          | 0          | 0          | 46         |
| Vehicle Extension [s]        | 3.0        | 0.0        | 3.0        | 0.0        | 0.0        | 0.0        | 3.0        |
| Walk [s]                     | 5          | 0          | 5          | 0          | 0          | 0          | 5          |
| Pedestrian Clearance [s]     | 10         | 0          | 10         | 0          | 0          | 0          | 10         |
| Rest In Walk                 | No         |            | No         |            |            |            | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 0.0        | 2.0        | 0.0        | 0.0        | 0.0        | 2.0        |
| I2, Clearance Lost Time [s]  | 2.0        | 0.0        | 2.0        | 0.0        | 0.0        | 0.0        | 2.0        |
| Minimum Recall               | No         |            | No         |            |            |            | No         |
| Maximum Recall               | No         |            | No         |            |            |            | No         |
| Pedestrian Recall            | No         |            | No         |            |            |            | No         |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Detector Length [ft]         | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C    | C    | L     | C    |
|-----------------------------------------|-------|------|------|-------|------|
| C, Cycle Length [s]                     | 46    | 46   | 46   | 46    | 46   |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00 | 4.00 | 4.00  | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00 | 0.00 | 2.00  | 0.00 |
| l2, Clearance Lost Time [s]             | 2.00  | 2.00 | 2.00 | 2.00  | 2.00 |
| g_i, Effective Green Time [s]           | 8     | 30   | 30   | 30    | 30   |
| g / C, Green / Cycle                    | 0.17  | 0.66 | 0.66 | 0.66  | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.13  | 0.48 | 0.49 | 0.65  | 0.28 |
| s, saturation flow rate [veh/h]         | 1674  | 1863 | 1819 | 269   | 5072 |
| c, Capacity [veh/h]                     | 284   | 1221 | 1192 | 230   | 3324 |
| d1, Uniform Delay [s]                   | 18.12 | 5.18 | 5.29 | 20.31 | 3.79 |
| k, delay calibration                    | 0.11  | 0.25 | 0.26 | 0.44  | 0.11 |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 |
| d2, Incremental Delay [s]               | 4.24  | 1.90 | 2.23 | 18.44 | 0.09 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 |

**Lane Group Results**

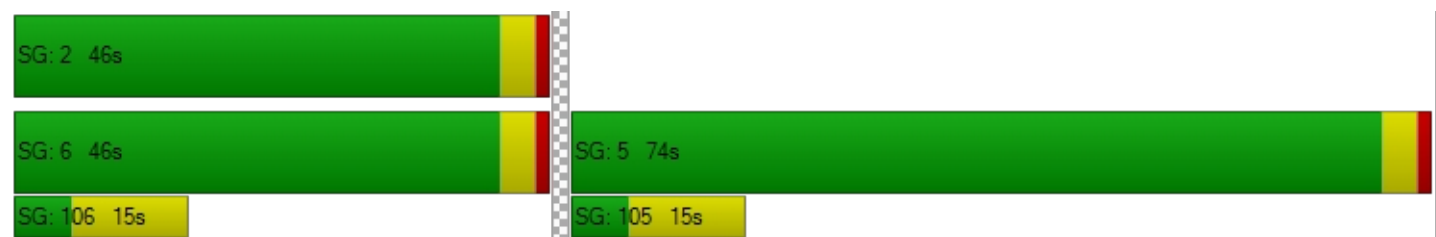
|                                       |        |       |       |        |       |
|---------------------------------------|--------|-------|-------|--------|-------|
| X, volume / capacity                  | 0.76   | 0.72  | 0.74  | 0.76   | 0.43  |
| d, Delay for Lane Group [s/veh]       | 22.37  | 7.08  | 7.53  | 38.74  | 3.88  |
| Lane Group LOS                        | C      | A     | A     | D      | A     |
| Critical Lane Group                   | Yes    | No    | No    | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 2.25   | 2.00  | 2.12  | 2.77   | 0.56  |
| 50th-Percentile Queue Length [ft/ln]  | 56.20  | 49.89 | 53.00 | 69.17  | 14.09 |
| 95th-Percentile Queue Length [veh/ln] | 4.05   | 3.59  | 3.82  | 4.98   | 1.01  |
| 95th-Percentile Queue Length [ft/ln]  | 101.15 | 89.81 | 95.40 | 124.51 | 25.36 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |      |       |       |      |
|---------------------------------|-------|-------|------|------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 22.37 | 22.37 | 7.29 | 7.53 | 38.74 | 38.74 | 3.88 |
| Movement LOS                    | C     | C     | A    | A    | D     | D     | A    |
| d_A, Approach Delay [s/veh]     | 22.37 |       | 7.30 |      | 7.64  |       |      |
| Approach LOS                    | C     |       | A    |      | A     |       |      |
| d_I, Intersection Delay [s/veh] | 8.36  |       |      |      |       |       |      |
| Intersection LOS                | A     |       |      |      |       |       |      |
| Intersection V/C                | 0.777 |       |      |      |       |       |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 6 | 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 22: MD 410/Prince George's Plaza

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 24.8  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.535 |

#### Intersection Setup

| Name                   | Metro                                                                             |        |        | PG Plaza                                                                          |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 2                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 250.00                                                                            | 100.00 | 250.00 | 225.00                                                                              | 100.00 | 100.00 | 325.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Metro  |        |        | PG Plaza |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 175    | 17     | 165    | 126      | 12     | 34     | 132    | 1307   | 62     | 98     | 1139   | 70     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.54   | 3.85   | 2.22   | 0.00     | 0.00   | 3.85   | 2.22   | 2.07   | 1.74   | 2.21   | 2.00   | 3.85   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 88     | 0      | 0      | 134    | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 175    | 17     | 165    | 126      | 12     | 34     | 132    | 1395   | 62     | 98     | 1273   | 70     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 49     | 5      | 46     | 35       | 3      | 9      | 37     | 388    | 17     | 27     | 354    | 19     |
| Total Analysis Volume [veh/h]           | 194    | 19     | 183    | 140      | 13     | 38     | 147    | 1550   | 69     | 109    | 1414   | 78     |
| Presence of On-Street Parking           | No     |        | No     | No       |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0        |        |        | 0      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0        |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 75.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 3     | 3     | 3     | 4     | 4     | 4     | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |          |         |         |          |         |         |
| Lead / Lag                   | Lag   | -     | -     | Lag   | -     | -     | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 5     | 5     | 5     | 5     | 5        | 20      | 20      | 5        | 20      | 20      |
| Maximum Green [s]            | 24    | 24    | 24    | 24    | 24    | 24    | 25       | 54      | 54      | 25       | 54      | 54      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   | 1.0      | 1.5     | 1.5     | 1.0      | 1.5     | 1.5     |
| Split [s]                    | 30    | 30    | 30    | 30    | 30    | 30    | 30       | 60      | 60      | 30       | 60      | 60      |
| Vehicle Extension [s]        | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5      | 5.0     | 5.0     | 2.5      | 5.0     | 5.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       | No    |       |       | No    |       |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.5   | 3.5   | 3.5   | 3.5   | 3.5   | 3.5   | 3.0      | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     |
| Minimum Recall               |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    |       |       | No    |       | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 294.0   | 294.0   | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 30.0  | 30.0  | 30.0  | 30.0     | 6.0     | 6.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | L     | C     | R     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 5.50  | 5.50  | 5.50  | 5.50  | 5.50  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.50  | 3.50  | 3.50  | 3.50  | 3.50  | 0.00  | 4.00  | 4.00  | 0.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 21    | 21    | 8     | 8     | 8     | 103   | 93    | 93    | 103   | 92    | 92    |
| g / C, Green / Cycle                    | 0.14  | 0.14  | 0.06  | 0.06  | 0.06  | 0.69  | 0.62  | 0.62  | 0.69  | 0.61  | 0.61  |
| (v / s)_i Volume / Saturation Flow Rate | 0.06  | 0.13  | 0.04  | 0.01  | 0.02  | 0.30  | 0.30  | 0.30  | 0.25  | 0.28  | 0.28  |
| s, saturation flow rate [veh/h]         | 3461  | 1577  | 3514  | 1900  | 1555  | 482   | 3544  | 1821  | 432   | 3547  | 1813  |
| c, Capacity [veh/h]                     | 490   | 223   | 197   | 106   | 87    | 349   | 2192  | 1126  | 316   | 2170  | 1110  |
| d1, Uniform Delay [s]                   | 58.54 | 63.38 | 69.62 | 67.30 | 68.52 | 11.08 | 15.63 | 15.64 | 11.16 | 15.65 | 15.65 |
| k, delay calibration                    | 0.08  | 0.24  | 0.08  | 0.08  | 0.08  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.39  | 23.35 | 3.54  | 0.38  | 2.55  | 3.71  | 0.78  | 1.51  | 2.98  | 0.69  | 1.35  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |       |       |       |        |        |       |        |        |
|---------------------------------------|--------|--------|--------|-------|-------|-------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.40   | 0.90   | 0.71   | 0.12  | 0.44  | 0.42  | 0.49   | 0.49   | 0.35  | 0.45   | 0.45   |
| d, Delay for Lane Group [s/veh]       | 58.93  | 86.73  | 73.16  | 67.68 | 71.07 | 14.79 | 16.41  | 17.16  | 14.14 | 16.34  | 17.00  |
| Lane Group LOS                        | E      | F      | E      | E     | E     | B     | B      | B      | B     | B      | B      |
| Critical Lane Group                   | No     | Yes    | Yes    | No    | No    | No    | No     | Yes    | Yes   | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 3.41   | 9.07   | 2.75   | 0.49  | 1.48  | 1.86  | 9.66   | 10.17  | 1.35  | 8.81   | 9.22   |
| 50th-Percentile Queue Length [ft/ln]  | 85.13  | 226.67 | 68.86  | 12.21 | 37.04 | 46.57 | 241.53 | 254.30 | 33.77 | 220.35 | 230.46 |
| 95th-Percentile Queue Length [veh/ln] | 6.13   | 14.00  | 4.96   | 0.88  | 2.67  | 3.35  | 14.76  | 15.40  | 2.43  | 13.68  | 14.20  |
| 95th-Percentile Queue Length [ft/ln]  | 153.24 | 350.12 | 123.95 | 21.98 | 66.67 | 83.83 | 368.97 | 385.06 | 60.79 | 342.08 | 354.94 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 58.93 | 86.73 | 86.73 | 73.16 | 67.68 | 71.07 | 14.79 | 16.64 | 17.16 | 14.14 | 16.54 | 17.00 |
| Movement LOS                    | E     | F     | F     | E     | E     | E     | B     | B     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 73.11 |       |       | 72.37 |       |       | 16.51 |       |       | 16.40 |       |       |
| Approach LOS                    | E     |       |       | E     |       |       | B     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 24.83 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.535 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 23: MD 410/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 67.9  
 Level Of Service: E  
 Volume to Capacity (v/c): 0.967

#### Intersection Setup

| Name                   |                                                                                   |        |        | Belcrest Rd                                                                       |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 250.00                                                                            | 100.00 | 100.00 | 250.00                                                                            | 100.00 | 100.00 | 225.00                                                                              | 100.00 | 100.00 | 225.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Belcrest Rd |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 363    | 387    | 6      | 310         | 601    | 126    | 210    | 1114   | 276    | 239    | 867    | 122    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.21   | 2.00   | 3.85   | 2.00        | 2.21   | 2.63   | 2.00   | 2.00   | 2.38   | 2.63   | 2.00   | 2.63   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 71     | 0      | 0      | 20          | 0      | 10     | 29     | 21     | 38     | 17     | 53     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 434    | 387    | 6      | 330         | 601    | 136    | 239    | 1135   | 314    | 256    | 920    | 122    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 121    | 108    | 2      | 92          | 167    | 38     | 66     | 315    | 87     | 71     | 256    | 34     |
| Total Analysis Volume [veh/h]           | 482    | 430    | 7      | 367         | 668    | 151    | 266    | 1261   | 349    | 284    | 1022   | 136    |
| Presence of On-Street Parking           | No     |        | No     | No          |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 26     |        |        | 10          |        |        | 91     |        |        | 71     |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0           |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 60.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap | Protecte | Permiss | Overlap |
|------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 7        | 4       | 4       | 3        | 8       | 3       | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |          |         |         |          |         |         |          |         | 6,7     |          |         | 2,3     |
| Lead / Lag                   | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5        | 5       | 5       | 5        | 5       | 5       | 5        | 20      | 20      | 5        | 20      | 20      |
| Maximum Green [s]            | 30       | 29      | 29      | 30       | 30      | 30      | 17       | 53      | 53      | 11       | 47      | 47      |
| Amber [s]                    | 3.0      | 4.0     | 4.0     | 4.0      | 3.0     | 4.0     | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 1.0      | 2.0     | 2.0     | 2.0      | 1.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| Split [s]                    | 30       | 36      | 36      | 20       | 46      | 20      | 30       | 60      | 60      | 24       | 54      | 54      |
| Vehicle Extension [s]        | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Walk [s]                     | 0        | 0       | 0       | 0        | 5       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0        | 10      | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 2.0      | 4.0     | 4.0     | 4.0      | 2.0     | 4.0     | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| Minimum Recall               | No       | No      |         | No       | No      |         | No       | No      | No      | No       | No      | No      |
| Maximum Recall               | No       | No      |         | No       | No      |         | No       | Yes     | Yes     | No       | Yes     | Yes     |
| Pedestrian Recall            | No       | No      |         | No       | No      |         | No       | No      | No      | No       | No      | No      |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 5.0     | 5.0     | 30.0     | 5.0     | 5.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | L     | C     | R     | L      | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150    | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 4.00  | 6.00  | 6.00  | 4.00  | 4.00  | 4.00  | 6.00  | 6.50  | 4.00  | 6.00   | 6.50  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 4.00  | 4.00  | 0.00  | 2.00  | 2.00  | 4.00  | 4.50  | 0.00  | 4.00   | 4.50  | 0.00  |
| g_i, Effective Green Time [s]           | 23    | 30    | 30    | 59    | 39    | 39    | 24    | 57    | 86    | 18     | 51    | 71    |
| g / C, Green / Cycle                    | 0.15  | 0.20  | 0.20  | 0.39  | 0.26  | 0.26  | 0.16  | 0.38  | 0.57  | 0.12   | 0.34  | 0.48  |
| (v / s)_i Volume / Saturation Flow Rate | 0.17  | 0.12  | 0.12  | 0.24  | 0.23  | 0.24  | 0.15  | 0.36  | 0.22  | 0.16   | 0.29  | 0.09  |
| s, saturation flow rate [veh/h]         | 2757  | 1863  | 1844  | 1538  | 1859  | 1659  | 1774  | 3547  | 1556  | 1763   | 3547  | 1564  |
| c, Capacity [veh/h]                     | 508   | 374   | 370   | 601   | 478   | 426   | 283   | 1346  | 892   | 211    | 1204  | 745   |
| d1, Uniform Delay [s]                   | 63.40 | 54.32 | 54.35 | 36.56 | 53.57 | 54.42 | 62.29 | 44.80 | 17.62 | 66.02  | 45.96 | 22.50 |
| k, delay calibration                    | 0.11  | 0.11  | 0.11  | 0.50  | 0.32  | 0.36  | 0.35  | 0.50  | 0.50  | 0.50   | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 9.95  | 1.46  | 1.50  | 4.58  | 14.56 | 23.21 | 31.45 | 13.45 | 1.29  | 183.59 | 7.55  | 0.54  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |        |        |        |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.95   | 0.59   | 0.59   | 0.61   | 0.88   | 0.93   | 0.94   | 0.94   | 0.39   | 1.35   | 0.85   | 0.18   |
| d, Delay for Lane Group [s/veh]       | 73.35  | 55.78  | 55.84  | 41.14  | 68.13  | 77.63  | 93.74  | 58.25  | 18.92  | 249.60 | 53.50  | 23.04  |
| Lane Group LOS                        | E      | E      | E      | D      | E      | E      | F      | E      | B      | F      | D      | C      |
| Critical Lane Group                   | No     | No     | No     | Yes    | No     | Yes    | No     | Yes    | No     | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 9.82   | 7.70   | 7.67   | 11.60  | 17.25  | 17.38  | 12.31  | 24.34  | 6.73   | 18.70  | 18.47  | 2.83   |
| 50th-Percentile Queue Length [ft/ln]  | 245.47 | 192.55 | 191.65 | 290.06 | 431.33 | 434.43 | 307.83 | 608.54 | 168.28 | 467.56 | 461.84 | 70.83  |
| 95th-Percentile Queue Length [veh/ln] | 14.96  | 12.25  | 12.21  | 17.19  | 24.07  | 24.21  | 18.07  | 32.43  | 10.99  | 28.93  | 25.52  | 5.10   |
| 95th-Percentile Queue Length [ft/ln]  | 373.94 | 306.34 | 305.16 | 429.71 | 601.63 | 605.34 | 451.70 | 810.82 | 274.65 | 723.13 | 638.06 | 127.50 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |        |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 73.35 | 55.81 | 55.84 | 41.14 | 71.62 | 77.63 | 93.74 | 58.25 | 18.92 | 249.60 | 53.50 | 23.04 |
| Movement LOS                    | E     | E     | E     | D     | E     | E     | F     | E     | B     | F      | D     | C     |
| d_A, Approach Delay [s/veh]     | 65.01 |       |       | 62.96 |       |       | 55.97 |       |       | 89.25  |       |       |
| Approach LOS                    | E     |       |       | E     |       |       | E     |       |       | F      |       |       |
| d_I, Intersection Delay [s/veh] | 67.88 |       |       |       |       |       |       |       |       |        |       |       |
| Intersection LOS                | E     |       |       |       |       |       |       |       |       |        |       |       |
| Intersection V/C                | 0.967 |       |       |       |       |       |       |       |       |        |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 24: MD 410/MD 500/Adelphi Rd

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 108.5 |
| Analysis Method: | HCM 2010   | Level Of Service:         | F     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.146 |

#### Intersection Setup

| Name                   | MD 500                                                                            |        |        | Adelphi Rd                                                                        |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 350.00                                                                            | 100.00 | 350.00 | 350.00                                                                            | 100.00 | 150.00 | 300.00                                                                              | 100.00 | 100.00 | 350.00                                                                              | 100.00 | 150.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | MD 500 |        |        | Adelphi Rd |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 35     | 657    | 480    | 525        | 352    | 47     | 101    | 1302   | 54     | 479    | 1205   | 400    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85   | 2.13   | 2.15   | 2.00       | 2.00   | 1.56   | 2.63   | 2.00   | 0.00   | 2.00   | 2.04   | 2.09   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 30     | 7      | 22     | 0          | 12     | 6      | 0      | 41     | 0      | 36     | 76     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 65     | 664    | 502    | 525        | 364    | 53     | 101    | 1343   | 54     | 515    | 1281   | 400    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 18     | 184    | 139    | 146        | 101    | 15     | 28     | 373    | 15     | 143    | 356    | 111    |
| Total Analysis Volume [veh/h]           | 72     | 738    | 558    | 583        | 404    | 59     | 112    | 1492   | 60     | 572    | 1423   | 444    |
| Presence of On-Street Parking           | No     |        | No     | No         |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 3      |        |        | 6          |        |        | 5      |        |        | 9      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0          |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 75.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Unsigna | Protecte | Permiss | Overlap |
|------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 3        | 8       | 0       | 7        | 4       | 0       | 1        | 6       | 0       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |          |         |         |          |         |         |          |         |         |          |         | 2,4     |
| Lead / Lag                   | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5        | 5       | 0       | 5        | 5       | 0       | 5        | 25      | 0       | 5        | 5       | 5       |
| Maximum Green [s]            | 5        | 30      | 0       | 30       | 29      | 0       | 12       | 46      | 0       | 27       | 61      | 61      |
| Amber [s]                    | 3.0      | 3.0     | 0.0     | 3.0      | 5.0     | 0.0     | 4.0      | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     |
| All red [s]                  | 1.0      | 1.0     | 0.0     | 1.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     |
| Split [s]                    | 12       | 39      | 0       | 25       | 52      | 0       | 18       | 53      | 0       | 33       | 68      | 68      |
| Vehicle Extension [s]        | 3.0      | 3.0     | 0.0     | 3.0      | 2.5     | 0.0     | 3.0      | 5.0     | 0.0     | 6.0      | 3.0     | 3.0     |
| Walk [s]                     | 0        | 5       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 10      | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 2.0      | 2.0     | 0.0     | 2.0      | 5.0     | 0.0     | 4.0      | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     |
| Minimum Recall               | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      | No      |
| Maximum Recall               | No       | No      |         | No       | No      |         | No       | Yes     |         | No       | Yes     | Yes     |
| Pedestrian Recall            | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      | No      |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 294.0   | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 6.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L      | C     | R      | L     | C     | R     | L     | C      | L     | C     | R    |
|-----------------------------------------|--------|-------|--------|-------|-------|-------|-------|--------|-------|-------|------|
| C, Cycle Length [s]                     | 150    | 150   | 150    | 150   | 150   | 150   | 150   | 150    | 150   | 150   | 150  |
| L, Total Lost Time per Cycle [s]        | 4.00   | 4.00  | 4.00   | 4.00  | 7.00  | 7.00  | 7.00  | 7.00   | 7.00  | 7.00  | 7.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00   | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00 |
| l2, Clearance Lost Time [s]             | 2.00   | 2.00  | 2.00   | 2.00  | 5.00  | 5.00  | 0.00  | 5.00   | 0.00  | 5.00  | 0.00 |
| g_i, Effective Green Time [s]           | 5      | 35    | 35     | 21    | 48    | 48    | 79    | 51     | 79    | 66    | 130  |
| g / C, Green / Cycle                    | 0.03   | 0.23  | 0.23   | 0.14  | 0.32  | 0.32  | 0.53  | 0.34   | 0.53  | 0.44  | 0.87 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04   | 0.21  | 0.36   | 0.17  | 0.11  | 0.04  | 0.20  | 0.42   | 0.36  | 0.40  | 0.28 |
| s, saturation flow rate [veh/h]         | 1743   | 3542  | 1563   | 3445  | 3547  | 1583  | 563   | 3547   | 1598  | 3545  | 1579 |
| c, Capacity [veh/h]                     | 58     | 824   | 364    | 483   | 1133  | 505   | 230   | 1203   | 705   | 1566  | 1370 |
| d1, Uniform Delay [s]                   | 72.50  | 55.79 | 57.55  | 64.50 | 39.21 | 36.09 | 31.69 | 49.56  | 44.29 | 39.05 | 1.83 |
| k, delay calibration                    | 0.41   | 0.11  | 0.50   | 0.11  | 0.08  | 0.08  | 0.50  | 0.50   | 0.50  | 0.50  | 0.50 |
| l, Upstream Filtering Factor            | 1.00   | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00 |
| d2, Incremental Delay [s]               | 184.64 | 3.75  | 254.20 | 98.18 | 0.14  | 0.08  | 7.20  | 115.40 | 9.87  | 9.32  | 0.63 |
| d3, Initial Queue Delay [s]             | 0.00   | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00 |
| Rp, platoon ratio                       | 1.00   | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00 |
| PF, progression factor                  | 1.00   | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00 |

**Lane Group Results**

|                                       |        |        |         |        |        |       |        |         |        |        |       |
|---------------------------------------|--------|--------|---------|--------|--------|-------|--------|---------|--------|--------|-------|
| X, volume / capacity                  | 1.24   | 0.90   | 1.53    | 1.21   | 0.36   | 0.12  | 0.49   | 1.24    | 0.81   | 0.91   | 0.32  |
| d, Delay for Lane Group [s/veh]       | 257.15 | 59.54  | 311.76  | 162.67 | 39.36  | 36.17 | 38.89  | 164.96  | 54.16  | 48.37  | 2.45  |
| Lane Group LOS                        | F      | E      | F       | F      | D      | D     | D      | F       | D      | D      | A     |
| Critical Lane Group                   | No     | No     | Yes     | Yes    | No     | No    | No     | Yes     | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 5.21   | 13.88  | 39.34   | 15.76  | 5.78   | 1.56  | 2.45   | 41.51   | 6.66   | 26.00  | 1.72  |
| 50th-Percentile Queue Length [ft/ln]  | 130.31 | 346.91 | 983.39  | 393.99 | 144.39 | 38.93 | 61.13  | 1037.87 | 166.44 | 649.90 | 43.08 |
| 95th-Percentile Queue Length [veh/ln] | 9.38   | 19.99  | 60.42   | 24.17  | 9.72   | 2.80  | 4.40   | 59.57   | 10.89  | 34.36  | 3.10  |
| 95th-Percentile Queue Length [ft/ln]  | 234.55 | 499.65 | 1510.42 | 604.15 | 242.92 | 70.08 | 110.03 | 1489.32 | 272.23 | 858.94 | 77.55 |



**Movement, Approach, & Intersection Results**

|                                 |        |       |        |        |       |       |        |        |      |       |       |      |
|---------------------------------|--------|-------|--------|--------|-------|-------|--------|--------|------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 257.15 | 59.54 | 311.76 | 162.67 | 39.36 | 36.17 | 38.89  | 164.96 | 0.00 | 54.16 | 48.37 | 2.45 |
| Movement LOS                    | F      | E     | F      | F      | D     | D     | D      | F      |      | D     | D     | A    |
| d_A, Approach Delay [s/veh]     | 172.82 |       |        | 107.91 |       |       | 156.16 |        |      | 41.37 |       |      |
| Approach LOS                    | F      |       |        | F      |       |       | F      |        |      | D     |       |      |
| d_I, Intersection Delay [s/veh] | 108.51 |       |        |        |       |       |        |        |      |       |       |      |
| Intersection LOS                | F      |       |        |        |       |       |        |        |      |       |       |      |
| Intersection V/C                | 1.146  |       |        |        |       |       |        |        |      |       |       |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 25: Ager Rd/23rd Ave

Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutes

Delay (sec / veh): 18.7  
Level Of Service: B  
Volume to Capacity (v/c): 0.432

#### Intersection Setup

| Name                   |                                                                                   |        |        |                                                                                   |        |        | Ager Rd.                                                                            |        |        | Ager Rd.                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present           | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                        |        |        |        |        |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|---------------------------------------------|--------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]                   | 14     | 24     | 13     | 199    | 31     | 37     | 21       | 635    | 3      | 25       | 811    | 14     |
| Base Volume Adjustment Factor               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   |
| Growth Rate                                 | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 30     | 0      | 0        | 49     | 0      |
| Diverted Trips [veh/h]                      | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]                 | 14     | 24     | 13     | 199    | 31     | 37     | 21       | 665    | 3      | 25       | 860    | 14     |
| Peak Hour Factor                            | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Other Adjustment Factor                     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 4      | 6      | 3      | 50     | 8      | 9      | 5        | 166    | 1      | 6        | 215    | 4      |
| Total Analysis Volume [veh/h]               | 14     | 24     | 13     | 199    | 31     | 37     | 21       | 665    | 3      | 25       | 860    | 14     |
| Presence of On-Street Parking               | No     |        | No     | No     |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]                 | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | Yes                             |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 0       | 8       | 0       | 0       | 4       | 0       | 0       | 2       | 0       | 0       | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       |
| Minimum Green [s]            | 0       | 6       | 0       | 0       | 6       | 0       | 0       | 35      | 0       | 0       | 35      | 0       |
| Maximum Green [s]            | 0       | 20      | 0       | 0       | 30      | 0       | 0       | 35      | 0       | 0       | 35      | 0       |
| Amber [s]                    | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 0       | 25      | 0       | 0       | 35      | 0       | 0       | 50      | 0       | 0       | 50      | 0       |
| Vehicle Extension [s]        | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 7       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 21      | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 2.00  | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 0.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 20    | 30    | 45    | 45    | 45    | 45    | 45    | 45    |
| g / C, Green / Cycle                    | 0.22  | 0.33  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| (v / s)_i Volume / Saturation Flow Rate | 0.03  | 0.19  | 0.04  | 0.20  | 0.20  | 0.04  | 0.26  | 0.26  |
| s, saturation flow rate [veh/h]         | 1545  | 1443  | 571   | 1683  | 1680  | 692   | 1683  | 1673  |
| c, Capacity [veh/h]                     | 394   | 516   | 252   | 841   | 840   | 325   | 841   | 837   |
| d1, Uniform Delay [s]                   | 28.11 | 24.44 | 22.78 | 14.04 | 14.04 | 19.49 | 15.21 | 15.21 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.68  | 3.69  | 0.65  | 1.40  | 1.40  | 0.46  | 2.30  | 2.31  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |       |        |        |       |        |        |
|---------------------------------------|-------|--------|-------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.13  | 0.52   | 0.08  | 0.40   | 0.40   | 0.08  | 0.52   | 0.52   |
| d, Delay for Lane Group [s/veh]       | 28.79 | 28.13  | 23.43 | 15.44  | 15.44  | 19.95 | 17.51  | 17.52  |
| Lane Group LOS                        | C     | C      | C     | B      | B      | B     | B      | B      |
| Critical Lane Group                   | No    | Yes    | No    | No     | No     | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 0.95  | 4.95   | 0.36  | 4.24   | 4.24   | 0.38  | 6.10   | 6.07   |
| 50th-Percentile Queue Length [ft/ln]  | 23.66 | 123.84 | 8.95  | 106.09 | 105.96 | 9.50  | 152.52 | 151.74 |
| 95th-Percentile Queue Length [veh/ln] | 1.70  | 8.60   | 0.64  | 7.62   | 7.61   | 0.68  | 10.15  | 10.11  |
| 95th-Percentile Queue Length [ft/ln]  | 42.58 | 215.09 | 16.12 | 190.56 | 190.37 | 17.10 | 253.79 | 252.75 |

**Movement, Approach, & Intersection Results**

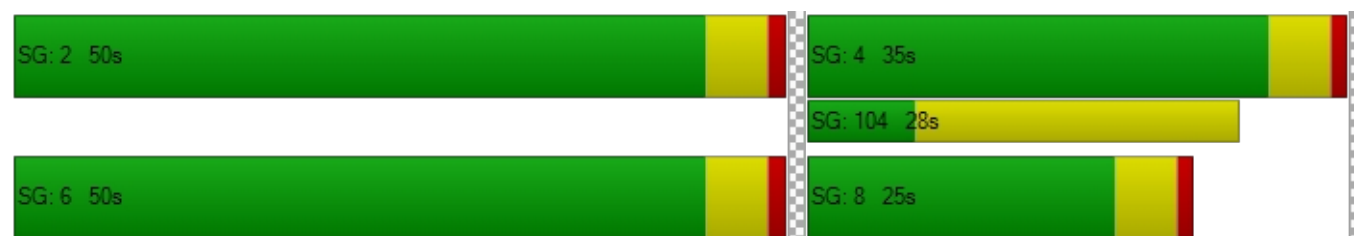
|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 28.79 | 28.79 | 28.79 | 28.13 | 28.13 | 28.13 | 23.43 | 15.44 | 15.44 | 19.95 | 17.52 | 17.52 |
| Movement LOS                    | C     | C     | C     | C     | C     | C     | C     | B     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 28.79 |       |       | 28.13 |       |       | 15.69 |       |       | 17.59 |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | B     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 18.68 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.432 |       |       |       |       |       |       |       |       |       |       |       |

**Other Modes**

|                                                          |       |       |       |       |
|----------------------------------------------------------|-------|-------|-------|-------|
| g_Walk,mi, Effective Walk Time [s]                       | 45.0  | 45.0  | 20.0  | 11.0  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  | 0.00  | 0.00  | 0.00  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  | 0.00  | 0.00  | 0.00  |
| d_p, Pedestrian Delay [s]                                | 11.25 | 11.25 | 27.22 | 34.67 |
| I_p,int, Pedestrian LOS Score for Intersection           | 1.756 | 1.860 | 3.019 | 2.687 |
| Crosswalk LOS                                            | A     | A     | C     | B     |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  | 2000  | 2000  | 2000  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 444   | 667   | 1000  | 1000  |
| d_b, Bicycle Delay [s]                                   | 27.22 | 20.00 | 11.25 | 11.25 |
| I_b,int, Bicycle LOS Score for Intersection              | 1.644 | 2.000 | 2.128 | 2.301 |
| Bicycle LOS                                              | A     | B     | B     | B     |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 26: Ager Rd/Oglethorpe St/School

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 47.2  |
| Analysis Method: | HCM 6th Edition | Level Of Service:         | D     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.394 |

#### Intersection Setup

| Name                   |                                                                                   |        |        |                                                                                   |        |        | Ager Rd.                                                                            |        |         | Ager Rd.                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|---------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |         | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |         |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right   | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00   | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1       | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 1200.00 | 350.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 35.00                                                                               |        |         | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |         | 0.00                                                                                |        |        |
| Curb Present           | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |         | No                                                                                  |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |         | Yes                                                                                 |        |        |

#### Volumes

| Name                                        |        |        |        |        |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|---------------------------------------------|--------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]                   | 21     | 0      | 32     | 2      | 0      | 0      | 51       | 981    | 2      | 3        | 1040   | 35     |
| Base Volume Adjustment Factor               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   |
| Growth Rate                                 | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 30     | 0      | 0        | 49     | 0      |
| Diverted Trips [veh/h]                      | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]                 | 21     | 0      | 32     | 2      | 0      | 0      | 51       | 1011   | 2      | 3        | 1089   | 35     |
| Peak Hour Factor                            | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Other Adjustment Factor                     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 5      | 0      | 8      | 1      | 0      | 0      | 13       | 253    | 1      | 1        | 272    | 9      |
| Total Analysis Volume [veh/h]               | 21     | 0      | 32     | 2      | 0      | 0      | 51       | 1011   | 2      | 3        | 1089   | 35     |
| Presence of On-Street Parking               | No     |        | No     | No     |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]                 | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | Yes                             |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 0       | 8       | 0       | 5        | 2       | 0       | 1        | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |          |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 0       | 5       | 0       | 5        | 10      | 0       | 5        | 10      | 0       |
| Maximum Green [s]            | 0       | 20      | 0       | 0       | 20      | 0       | 20       | 30      | 0       | 20       | 30      | 0       |
| Amber [s]                    | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 4.0      | 4.0     | 0.0     | 4.0      | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     |
| Split [s]                    | 0       | 30      | 0       | 0       | 30      | 0       | 30       | 45      | 0       | 30       | 45      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 6.0     | 0.0     | 3.0      | 6.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 27      | 0       | 0        | 11      | 0       | 0        | 12      | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 109   | 109   | 109   | 109   | 109   | 109   | 109   | 109   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 0.00  | 3.00  | 3.00  | 0.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 25    | 25    | 70    | 40    | 40    | 70    | 40    | 40    |
| g / C, Green / Cycle                    | 0.23  | 0.23  | 0.64  | 0.37  | 0.37  | 0.64  | 0.37  | 0.37  |
| (v / s)_i Volume / Saturation Flow Rate | 0.04  | 0.00  | 0.06  | 0.30  | 0.30  | 0.00  | 0.34  | 0.34  |
| s, saturation flow rate [veh/h]         | 1384  | 1255  | 912   | 1683  | 1682  | 942   | 1683  | 1665  |
| c, Capacity [veh/h]                     | 363   | 354   | 537   | 618   | 617   | 564   | 618   | 611   |
| d1, Uniform Delay [s]                   | 33.54 | 32.42 | 13.50 | 31.25 | 31.25 | 11.07 | 32.88 | 32.88 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.84  | 0.03  | 0.35  | 11.64 | 11.64 | 0.02  | 20.42 | 20.62 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |       |       |        |        |       |        |        |
|---------------------------------------|-------|-------|-------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.15  | 0.01  | 0.10  | 0.82   | 0.82   | 0.01  | 0.91   | 0.92   |
| d, Delay for Lane Group [s/veh]       | 34.38 | 32.45 | 13.85 | 42.88  | 42.89  | 11.08 | 53.30  | 53.51  |
| Lane Group LOS                        | C     | C     | B     | D      | D      | B     | D      | D      |
| Critical Lane Group                   | Yes   | No    | Yes   | No     | No     | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 1.21  | 0.04  | 0.46  | 13.64  | 13.63  | 0.03  | 17.16  | 17.01  |
| 50th-Percentile Queue Length [ft/ln]  | 30.20 | 1.10  | 11.48 | 340.89 | 340.69 | 0.65  | 429.01 | 425.31 |
| 95th-Percentile Queue Length [veh/ln] | 2.17  | 0.08  | 0.83  | 19.69  | 19.68  | 0.05  | 23.95  | 23.78  |
| 95th-Percentile Queue Length [ft/ln]  | 54.36 | 1.97  | 20.67 | 492.29 | 492.04 | 1.16  | 598.85 | 594.42 |

**Movement, Approach, & Intersection Results**

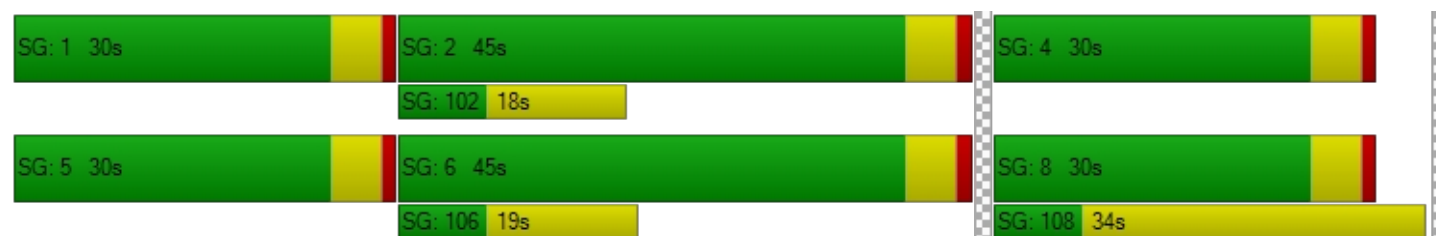
|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 34.38 | 34.38 | 34.38 | 32.45 | 32.45 | 32.45 | 13.85 | 42.89 | 42.89 | 11.08 | 53.40 | 53.51 |
| Movement LOS                    | C     | C     | C     | C     | C     | C     | B     | D     | D     | B     | D     | D     |
| d_A, Approach Delay [s/veh]     | 34.38 |       |       | 32.45 |       |       | 41.49 |       |       | 53.29 |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 47.24 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.394 |       |       |       |       |       |       |       |       |       |       |       |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 11.0  |  |  | 11.0  |  |  | 25.0  |  |  | 11.0  |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 34.67 |  |  | 34.67 |  |  | 23.47 |  |  | 34.67 |  |  |
| I_p,int, Pedestrian LOS Score for Intersection           | 1.810 |  |  | 1.719 |  |  | 2.784 |  |  | 2.820 |  |  |
| Crosswalk LOS                                            | A     |  |  | A     |  |  | C     |  |  | C     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 556   |  |  | 556   |  |  | 889   |  |  | 889   |  |  |
| d_b, Bicycle Delay [s]                                   | 23.47 |  |  | 23.47 |  |  | 13.89 |  |  | 13.89 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 1.647 |  |  | 1.563 |  |  | 2.437 |  |  | 2.489 |  |  |
| Bicycle LOS                                              | A     |  |  | A     |  |  | B     |  |  | B     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 27: Ager Rd/Nicholson St

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 11.0  
Level Of Service: B  
Volume to Capacity (v/c): 0.512

#### Intersection Setup

| Name                   | Ager Rd                                                                           |       |       |       | Nicholson St                                                                      |        |        | Nicholson St                                                                        |        |        | Ager Rd.                                                                            |       |       |       |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|
| Approach               | Northbound                                                                        |       |       |       | Northeastbound                                                                    |        |        | Southwestbound                                                                      |        |        | Southeastbound                                                                      |       |       |       |
| Lane Configuration     |  |       |       |       |  |        |        |  |        |        |  |       |       |       |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 1     | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 1                                                                                   | 0     | 0     | 0     |
| Pocket Length [ft]     | 225.0                                                                             | 100.0 | 100.0 | 150.0 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 200.0                                                                               | 100.0 | 100.0 | 100.0 |
| Speed [mph]            | 35.00                                                                             |       |       |       | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 35.00                                                                               |       |       |       |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |       |       |       |
| Crosswalk              | Yes                                                                               |       |       |       | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |       |       |       |

#### Volumes

| Name                                    | Ager Rd |       |       |       | Nicholson St |        |        | Nicholson St |        |        | Ager Rd. |       |       |       |
|-----------------------------------------|---------|-------|-------|-------|--------------|--------|--------|--------------|--------|--------|----------|-------|-------|-------|
| Base Volume Input [veh/h]               | 1       | 78    | 838   | 96    | 69           | 14     | 70     | 25           | 10     | 107    | 6        | 175   | 742   | 93    |
| Base Volume Adjustment Factor           | 1.000   | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000    | 1.000 | 1.000 | 1.000 |
| Heavy Vehicles Percentage [%]           | 0.00    | 0.00  | 2.00  | 0.00  | 2.00         | 0.00   | 1.82   | 0.00         | 0.00   | 1.74   | 0.00     | 2.44  | 2.00  | 3.57  |
| Growth Rate                             | 1.00    | 1.00  | 1.00  | 1.00  | 1.00         | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00     | 1.00  | 1.00  | 1.00  |
| In-Process Volume [veh/h]               | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Site-Generated Trips [veh/h]            | 0       | 0     | 30    | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 49    | 0     |
| Diverted Trips [veh/h]                  | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Pass-by Trips [veh/h]                   | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Existing Site Adjustment Volume [veh/h] | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Other Volume [veh/h]                    | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Right-Turn on Red Volume [veh/h]        | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Total Hourly Volume [veh/h]             | 1       | 78    | 868   | 96    | 69           | 14     | 70     | 25           | 10     | 107    | 6        | 175   | 791   | 93    |
| Peak Hour Factor                        | 0.900   | 0.900 | 0.900 | 0.900 | 0.9000       | 0.9000 | 0.9000 | 0.9000       | 0.9000 | 0.9000 | 0.900    | 0.900 | 0.900 | 0.900 |
| Other Adjustment Factor                 | 1.000   | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000    | 1.000 | 1.000 | 1.000 |
| Total 15-Minute Volume [veh/h]          | 0       | 22    | 241   | 27    | 19           | 4      | 19     | 7            | 3      | 30     | 2        | 49    | 220   | 26    |
| Total Analysis Volume [veh/h]           | 1       | 87    | 964   | 107   | 77           | 16     | 78     | 28           | 11     | 119    | 7        | 194   | 879   | 103   |
| Presence of On-Street Parking           | No      |       |       | No    | No           |        | No     | No           |        | No     | No       |       |       | No    |
| On-Street Parking Maneuver Rate [/h]    | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Local Bus Stopping Rate [/h]            | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Pedestrian Volume [ped/h]               | 0       |       |       |       | 0            |        |        | 0            |        |        | 0        |       |       |       |
| Bicycle Volume [bicycles/h]             | 0       |       |       |       | 0            |        |        | 0            |        |        | 0        |       |       |       |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permi | Permi | Permi | Permi | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permi | Permi | Permi | Permi |
|------------------------------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|-------|-------|-------|-------|
| Signal group                 | 0     | 0     | 2     | 0     | 0       | 8       | 0       | 0       | 4       | 0       | 0     | 0     | 6     | 0     |
| Auxiliary Signal Groups      |       |       |       |       |         |         |         |         |         |         |       |       |       |       |
| Lead / Lag                   | -     | -     | -     | -     | -       | -       | -       | -       | -       | -       | -     | -     | -     | -     |
| Minimum Green [s]            | 0     | 0     | 5     | 0     | 0       | 5       | 0       | 0       | 5       | 0       | 0     | 0     | 5     | 0     |
| Maximum Green [s]            | 0     | 0     | 30    | 0     | 0       | 30      | 0       | 0       | 30      | 0       | 0     | 0     | 30    | 0     |
| Amber [s]                    | 0.0   | 0.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0   | 0.0   | 3.0   | 0.0   |
| All red [s]                  | 0.0   | 0.0   | 1.0   | 0.0   | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0   | 0.0   | 1.0   | 0.0   |
| Split [s]                    | 0     | 0     | 68    | 0     | 0       | 22      | 0       | 0       | 22      | 0       | 0     | 0     | 68    | 0     |
| Vehicle Extension [s]        | 0.0   | 0.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0   | 0.0   | 3.0   | 0.0   |
| Walk [s]                     | 0     | 0     | 5     | 0     | 0       | 5       | 0       | 0       | 5       | 0       | 0     | 0     | 5     | 0     |
| Pedestrian Clearance [s]     | 0     | 0     | 10    | 0     | 0       | 10      | 0       | 0       | 10      | 0       | 0     | 0     | 10    | 0     |
| Rest In Walk                 |       |       | No    |       |         | No      |         |         | No      |         |       |       | No    |       |
| I1, Start-Up Lost Time [s]   | 0.0   | 0.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0   | 0.0   | 2.0   | 0.0   |
| I2, Clearance Lost Time [s]  | 0.0   | 0.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0   | 0.0   | 2.0   | 0.0   |
| Minimum Recall               |       |       | No    |       |         | No      |         |         | No      |         |       |       | No    |       |
| Maximum Recall               |       |       | No    |       |         | No      |         |         | No      |         |       |       | No    |       |
| Pedestrian Recall            |       |       | No    |       |         | No      |         |         | No      |         |       |       | No    |       |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | C     | C     | L     | C    | C    |
|-----------------------------------------|------|------|------|-------|-------|-------|------|------|
| C, Cycle Length [s]                     | 90   | 90   | 90   | 90    | 90    | 90    | 90   | 90   |
| L, Total Lost Time per Cycle [s]        | 4.00 | 4.00 | 4.00 | 4.00  | 4.00  | 4.00  | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 2.00  | 2.00  | 2.00  | 0.00 | 0.00 |
| l2, Clearance Lost Time [s]             | 2.00 | 2.00 | 2.00 | 2.00  | 2.00  | 2.00  | 2.00 | 2.00 |
| g_i, Effective Green Time [s]           | 64   | 64   | 64   | 18    | 18    | 64    | 64   | 64   |
| g / C, Green / Cycle                    | 0.71 | 0.71 | 0.71 | 0.20  | 0.20  | 0.71  | 0.71 | 0.71 |
| (v / s)_i Volume / Saturation Flow Rate | 0.15 | 0.29 | 0.29 | 0.13  | 0.10  | 0.38  | 0.27 | 0.27 |
| s, saturation flow rate [veh/h]         | 582  | 1863 | 1798 | 1340  | 1638  | 523   | 1863 | 1795 |
| c, Capacity [veh/h]                     | 419  | 1325 | 1279 | 326   | 375   | 378   | 1325 | 1277 |
| d1, Uniform Delay [s]                   | 9.23 | 5.31 | 5.31 | 33.03 | 31.80 | 13.56 | 5.13 | 5.14 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  | 0.50 | 0.50 |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |
| d2, Incremental Delay [s]               | 1.14 | 0.95 | 0.98 | 5.93  | 3.46  | 5.29  | 0.82 | 0.85 |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |

**Lane Group Results**

|                                       |       |        |        |        |        |        |        |        |
|---------------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.21  | 0.41   | 0.41   | 0.52   | 0.42   | 0.53   | 0.38   | 0.38   |
| d, Delay for Lane Group [s/veh]       | 10.37 | 6.25   | 6.29   | 38.96  | 35.25  | 18.85  | 5.95   | 5.99   |
| Lane Group LOS                        | B     | A      | A      | D      | D      | B      | A      | A      |
| Critical Lane Group                   | No    | No     | No     | Yes    | No     | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 0.89  | 3.51   | 3.41   | 3.93   | 3.35   | 3.05   | 3.11   | 3.01   |
| 50th-Percentile Queue Length [ft/ln]  | 22.28 | 87.80  | 85.22  | 98.32  | 83.63  | 76.37  | 77.73  | 75.36  |
| 95th-Percentile Queue Length [veh/ln] | 1.60  | 6.32   | 6.14   | 7.08   | 6.02   | 5.50   | 5.60   | 5.43   |
| 95th-Percentile Queue Length [ft/ln]  | 40.11 | 158.04 | 153.39 | 176.98 | 150.54 | 137.47 | 139.92 | 135.65 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |      |       |       |       |       |       |       |       |       |      |      |
|---------------------------------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| d_M, Delay for Movement [s/veh] | 10.37 | 10.37 | 6.27 | 6.29 | 38.96 | 38.96 | 38.96 | 35.25 | 35.25 | 35.25 | 18.85 | 18.85 | 5.97 | 5.99 |
| Movement LOS                    | B     | B     | A    | A    | D     | D     | D     | D     | D     | D     | B     | B     | A    | A    |
| d_A, Approach Delay [s/veh]     | 6.58  |       |      |      | 38.96 |       |       | 35.25 |       |       | 8.16  |       |      |      |
| Approach LOS                    | A     |       |      |      | D     |       |       | D     |       |       | A     |       |      |      |
| d_I, Intersection Delay [s/veh] | 11.05 |       |      |      |       |       |       |       |       |       |       |       |      |      |
| Intersection LOS                | B     |       |      |      |       |       |       |       |       |       |       |       |      |      |
| Intersection V/C                | 0.512 |       |      |      |       |       |       |       |       |       |       |       |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 68s

SG: 4 22s

SG: 102 15s

SG: 104 15s

SG: 6 68s

SG: 8 22s

SG: 106 15s

SG: 108 15s

### Intersection Level Of Service Report

#### Intersection 28: Ager Rd/Hamilton St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 37.7  
 Level Of Service: D  
 Volume to Capacity (v/c): 1,901.841

#### Intersection Setup

| Name                   | Hamilton St                                                                       |        |        | Hamilton St                                                                       |        |        | Ager Rd.                                                                            |        |        | Ager Rd.                                                                            |        |         |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|---------|
| Approach               | Eastbound                                                                         |        |        | Westbound                                                                         |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |         |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |         |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00   |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1       |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 1500.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |         |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |         |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |         |

#### Volumes

| Name                                    | Hamilton St |        |        | Hamilton St |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|-----------------------------------------|-------------|--------|--------|-------------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]               | 65          | 158    | 16     | 130         | 83     | 488    | 28       | 388    | 125    | 454      | 290    | 50     |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.33        | 1.72   | 0.00   | 3.85        | 2.08   | 1.91   | 2.06     | 1.84   | 3.33   | 2.21     | 2.00   | 2.63   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]            | 30          | 51     | 37     | 0           | 84     | 0      | 61       | 0      | 0      | 0        | 0      | 49     |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]             | 95          | 209    | 53     | 130         | 167    | 488    | 89       | 388    | 125    | 454      | 290    | 99     |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 26          | 58     | 15     | 36          | 46     | 136    | 25       | 108    | 35     | 126      | 81     | 28     |
| Total Analysis Volume [veh/h]           | 106         | 232    | 59     | 144         | 186    | 542    | 99       | 431    | 139    | 504      | 322    | 110    |
| Presence of On-Street Parking           | No          |        | No     | No          |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0           |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0           |        |        | 0        |        |        | 0        |        |        |



**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 80                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal group                 | 0       | 8       | 0       | 0       | 4       | 0       | 0       | 2       | 0       | 1        | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |          |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | -       | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 10      | 0       | 5        | 10      | 0       |
| Maximum Green [s]            | 0       | 26      | 0       | 0       | 26      | 0       | 0       | 30      | 0       | 10       | 45      | 0       |
| Amber [s]                    | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     |
| Split [s]                    | 0       | 30      | 0       | 0       | 30      | 0       | 0       | 35      | 0       | 15       | 50      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 3.0     | 0.0     | 2.0      | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | Yes     |         | Yes      | Yes     |         |
| Maximum Recall               |         | No      |         |         | No      |         |         | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C       | C     | C     | C     | L     | C     | C     | L     | C     |
|-----------------------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 73      | 73    | 73    | 73    | 73    | 73    | 73    | 73    | 73    |
| L, Total Lost Time per Cycle [s]        | 4.00    | 4.00  | 4.00  | 4.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00    | 0.00  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00    | 2.00  | 2.00  | 2.00  | 3.00  | 3.00  | 3.00  | 0.00  | 3.00  |
| g_i, Effective Green Time [s]           | 26      | 26    | 26    | 26    | 24    | 24    | 24    | 38    | 38    |
| g / C, Green / Cycle                    | 0.36    | 0.36  | 0.36  | 0.36  | 0.33  | 0.33  | 0.33  | 0.52  | 0.52  |
| (v / s)_i Volume / Saturation Flow Rate | 1588.26 | 0.18  | 0.35  | 0.38  | 0.10  | 0.16  | 0.16  | 0.44  | 0.24  |
| s, saturation flow rate [veh/h]         | 0       | 1641  | 950   | 1440  | 952   | 1866  | 1712  | 1133  | 1783  |
| c, Capacity [veh/h]                     | 99      | 586   | 411   | 514   | 234   | 610   | 559   | 625   | 925   |
| d1, Uniform Delay [s]                   | 36.39   | 18.27 | 25.63 | 23.39 | 29.92 | 19.61 | 19.64 | 15.00 | 11.11 |
| k, delay calibration                    | 0.50    | 0.11  | 0.42  | 0.48  | 0.11  | 0.11  | 0.11  | 0.50  | 0.11  |
| l, Upstream Filtering Factor            | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 111.02  | 0.65  | 13.23 | 53.95 | 1.22  | 0.60  | 0.67  | 10.65 | 0.37  |
| d3, Initial Queue Delay [s]             | 0.00    | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |       |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 1.07   | 0.50   | 0.80   | 1.05   | 0.42  | 0.49   | 0.49   | 0.81   | 0.47   |
| d, Delay for Lane Group [s/veh]       | 147.41 | 18.93  | 38.87  | 77.34  | 31.14 | 20.21  | 20.30  | 25.66  | 11.48  |
| Lane Group LOS                        | F      | B      | D      | F      | C     | C      | C      | C      | B      |
| Critical Lane Group                   | Yes    | No     | No     | No     | No    | No     | Yes    | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 4.75   | 3.61   | 6.79   | 15.63  | 1.65  | 3.80   | 3.53   | 6.51   | 3.86   |
| 50th-Percentile Queue Length [ft/ln]  | 118.66 | 90.25  | 169.85 | 390.85 | 41.32 | 94.93  | 88.19  | 162.73 | 96.60  |
| 95th-Percentile Queue Length [veh/ln] | 8.54   | 6.50   | 11.07  | 22.89  | 2.97  | 6.83   | 6.35   | 10.69  | 6.96   |
| 95th-Percentile Queue Length [ft/ln]  | 213.59 | 162.46 | 276.71 | 572.14 | 74.37 | 170.87 | 158.74 | 267.33 | 173.89 |

**Movement, Approach, & Intersection Results**

|                                 |          |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 147.41   | 18.93 | 18.93 | 38.87 | 38.87 | 77.34 | 31.14 | 20.24 | 20.30 | 25.66 | 11.48 | 11.48 |
| Movement LOS                    | F        | B     | B     | D     | D     | F     | C     | C     | C     | C     | B     | B     |
| d_A, Approach Delay [s/veh]     | 53.23    |       |       | 62.78 |       |       | 21.86 |       |       | 19.11 |       |       |
| Approach LOS                    | D        |       |       | E     |       |       | C     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 37.71    |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D        |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 1901.841 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 29: Toledo Rd/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 15.2  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.549

#### Intersection Setup

| Name                   | Belcrest Rd                                                                       |       |       |       | Belcrest Rd                                                                       |       |       |       | Toledo Rd                                                                           |        |        | Toledo Rd                                                                           |        |        |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |       |       |       | Southbound                                                                        |       |       |       | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |       |       |       |  |       |       |       |  |        |        |  |        |        |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | U-tu                                                                              | Left  | Thru  | Right | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 0     | 1                                                                                 | 0     | 0     | 0     | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 400.0                                                                             | 100.0 | 100.0 | 100.0 | 200.0                                                                             | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |       |       |       | 30.00                                                                             |       |       |       | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |       |       |       | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |       |       |       | No                                                                                |       |       |       | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Rd |       |       |       | Belcrest Rd |       |       |       | Toledo Rd |        |        | Toledo Rd |        |        |
|-----------------------------------------|-------------|-------|-------|-------|-------------|-------|-------|-------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h]               | 15          | 192   | 383   | 78    | 2           | 93    | 444   | 144   | 157       | 69     | 179    | 56        | 80     | 87     |
| Base Volume Adjustment Factor           | 1.000       | 1.000 | 1.000 | 1.000 | 1.000       | 1.000 | 1.000 | 1.000 | 1.0000    | 1.0000 | 1.0000 | 1.0000    | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00        | 3.03  | 1.83  | 1.37  | 0.00        | 2.00  | 2.02  | 0.00  | 0.00      | 2.86   | 0.00   | 2.86      | 3.45   | 2.13   |
| Growth Rate                             | 1.00        | 1.00  | 1.00  | 1.00  | 1.00        | 1.00  | 1.00  | 1.00  | 1.00      | 1.00   | 1.00   | 1.00      | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 0     | 8     | 0     | 0           | 0     | 10    | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Total Hourly Volume [veh/h]             | 15          | 192   | 391   | 78    | 2           | 93    | 454   | 144   | 157       | 69     | 179    | 56        | 80     | 87     |
| Peak Hour Factor                        | 0.900       | 0.900 | 0.900 | 0.900 | 0.900       | 0.900 | 0.900 | 0.900 | 0.9000    | 0.9000 | 0.9000 | 0.9000    | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.000       | 1.000 | 1.000 | 1.000 | 1.000       | 1.000 | 1.000 | 1.000 | 1.0000    | 1.0000 | 1.0000 | 1.0000    | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4           | 53    | 109   | 22    | 1           | 26    | 126   | 40    | 44        | 19     | 50     | 16        | 22     | 24     |
| Total Analysis Volume [veh/h]           | 17          | 213   | 434   | 87    | 2           | 103   | 504   | 160   | 174       | 77     | 199    | 62        | 89     | 97     |
| Presence of On-Street Parking           | No          |       |       | No    | No          |       |       | No    | No        |        | No     | No        |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Pedestrian Volume [ped/h]               | 8           |       |       |       | 0           |       |       |       | 20        |        |        | 15        |        |        |
| Bicycle Volume [bicycles/h]             | 0           |       |       |       | 0           |       |       |       | 0         |        |        | 0         |        |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 80             |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 0.0            |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 12.00          |

**Phasing & Timing**

| Control Type                 | Permi | Permi | Permi | Permi | Permi | Permi | Permi | Permi | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 2     | 2     | 2     | 2     | 6     | 6     | 6     | 6     | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |         |         |         |         |         |         |
| Lead / Lag                   | Lag   | Lag   | -     | -     | Lag   | Lag   | -     | -     | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 4     | 4     | 4     | 4     | 4     | 4     | 4     | 4     | 4       | 4       | 4       | 4       | 4       | 4       |
| Maximum Green [s]            | 40    | 40    | 40    | 40    | 40    | 40    | 40    | 40    | 30      | 30      | 30      | 30      | 30      | 30      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 30    | 30    | 30    | 30    | 30    | 30    | 30    | 30    | 30      | 30      | 30      | 30      | 30      | 30      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7       | 7       | 7       | 7       | 7       | 7       |
| Pedestrian Clearance [s]     | 15    | 15    | 15    | 15    | 15    | 15    | 15    | 15    | 21      | 21      | 21      | 21      | 21      | 21      |
| Rest In Walk                 |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| Maximum Recall               |       |       | Yes   |       |       |       | Yes   |       |         | No      |         |         | No      |         |
| Pedestrian Recall            |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 30.0  | 30.0  | 0.0   | 0.0   | 0.0   | 0.0   | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | C    | L     | C    | C    | L     | C     | R     | C     |
|-----------------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 72    | 72   | 72   | 72    | 72   | 72   | 72    | 72    | 72    | 72    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00 | 5.00 | 5.00  | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 2.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00 | 3.00 | 3.00  | 3.00 | 3.00 | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 40    | 40   | 40   | 40    | 40   | 40   | 22    | 22    | 22    | 22    |
| g / C, Green / Cycle                    | 0.55  | 0.55 | 0.55 | 0.55  | 0.55 | 0.55 | 0.31  | 0.31  | 0.31  | 0.31  |
| (v / s)_i Volume / Saturation Flow Rate | 0.30  | 0.14 | 0.14 | 0.12  | 0.19 | 0.19 | 0.14  | 0.04  | 0.12  | 0.15  |
| s, saturation flow rate [veh/h]         | 760   | 1866 | 1750 | 874   | 1862 | 1694 | 1217  | 1847  | 1602  | 1603  |
| c, Capacity [veh/h]                     | 414   | 1032 | 968  | 487   | 1031 | 937  | 328   | 570   | 494   | 557   |
| d1, Uniform Delay [s]                   | 17.81 | 8.42 | 8.43 | 12.72 | 8.85 | 8.88 | 27.85 | 18.04 | 19.74 | 20.24 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50 | 0.50 | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 5.30  | 0.61 | 0.66 | 1.01  | 0.88 | 0.99 | 1.34  | 0.11  | 0.53  | 0.56  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |       |       |       |        |        |        |       |        |        |
|---------------------------------------|--------|-------|-------|-------|--------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.56   | 0.26  | 0.26  | 0.22  | 0.34   | 0.34   | 0.53   | 0.14  | 0.40   | 0.45   |
| d, Delay for Lane Group [s/veh]       | 23.11  | 9.03  | 9.09  | 13.74 | 9.73   | 9.87   | 29.19  | 18.15 | 20.27  | 20.80  |
| Lane Group LOS                        | C      | A     | A     | B     | A      | A      | C      | B     | C      | C      |
| Critical Lane Group                   | Yes    | No    | No    | No    | No     | No     | No     | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 3.54   | 2.08  | 1.98  | 1.13  | 2.83   | 2.64   | 2.85   | 0.90  | 2.57   | 3.28   |
| 50th-Percentile Queue Length [ft/ln]  | 88.47  | 51.89 | 49.42 | 28.14 | 70.76  | 66.03  | 71.23  | 22.53 | 64.33  | 82.09  |
| 95th-Percentile Queue Length [veh/ln] | 6.37   | 3.74  | 3.56  | 2.03  | 5.09   | 4.75   | 5.13   | 1.62  | 4.63   | 5.91   |
| 95th-Percentile Queue Length [ft/ln]  | 159.24 | 93.40 | 88.95 | 50.66 | 127.37 | 118.86 | 128.22 | 40.55 | 115.79 | 147.77 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |      |       |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|-------|------|------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 23.11 | 23.11 | 9.05 | 9.09 | 13.74 | 13.74 | 9.77 | 9.87 | 29.19 | 18.15 | 20.27 | 20.80 | 20.80 | 20.80 |
| Movement LOS                    | C     | C     | A    | A    | B     | B     | A    | A    | C     | B     | C     | C     | C     | C     |
| d_A, Approach Delay [s/veh]     | 13.36 |       |      |      | 10.33 |       |      |      | 23.36 |       |       | 20.80 |       |       |
| Approach LOS                    | B     |       |      |      | B     |       |      |      | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 15.17 |       |      |      |       |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | B     |       |      |      |       |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.549 |       |      |      |       |       |      |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 45s

SG: 102 22s

SG: 6 45s

SG: 106 22s

SG: 4 35s

SG: 104 28s

SG: 8 35s



### Intersection Level Of Service Report

#### Intersection 30: Adelphi Rd/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 35.2  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.873

#### Intersection Setup

| Name                   | Belcrest Rd                                                                       |        |        | Underwood St                                                                      |        |        | Adelphi Rd                                                                          |       |       |       | Adelphi Rd                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |       |       |       | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |       |       |       |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0     | 0     | 0     | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 150.0                                                                               | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |       |       |       | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |       |       |       | 0.00                                                                                |        |        |
| Crosswalk              | No                                                                                |        |        | Yes                                                                               |        |        | Yes                                                                                 |       |       |       | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Rd |        |        | Underwood St |        |        | Adelphi Rd |       |       |       | Adelphi Rd |        |        |
|-----------------------------------------|-------------|--------|--------|--------------|--------|--------|------------|-------|-------|-------|------------|--------|--------|
| Base Volume Input [veh/h]               | 693         | 0      | 68     | 10           | 8      | 1      | 2          | 17    | 1150  | 0     | 0          | 819    | 650    |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000      | 1.000 | 1.000 | 1.000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.12        | 0.00   | 0.00   | 0.00         | 0.00   | 0.00   | 0.00       | 0.00  | 1.98  | 0.00  | 0.00       | 1.99   | 1.94   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00       | 1.00  | 1.00  | 1.00  | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 8           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 7     | 0     | 0          | 18     | 10     |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 701         | 0      | 68     | 10           | 8      | 1      | 2          | 17    | 1157  | 0     | 0          | 837    | 660    |
| Peak Hour Factor                        | 0.9000      | 1.0000 | 1.0000 | 0.9000       | 0.9000 | 0.9000 | 0.900      | 0.900 | 0.900 | 1.000 | 1.0000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000      | 1.000 | 1.000 | 1.000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 195         | 0      | 17     | 3            | 2      | 0      | 1          | 5     | 321   | 0     | 0          | 233    | 183    |
| Total Analysis Volume [veh/h]           | 779         | 0      | 68     | 11           | 9      | 1      | 2          | 19    | 1286  | 0     | 0          | 930    | 733    |
| Presence of On-Street Parking           | No          |        | No     | No           |        | No     | No         |       |       | No    | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0            |        |        | 1          |       |       |       | 5          |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0            |        |        | 0          |       |       |       | 0          |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 122                          |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Permi | Prote | Permi | Permi | Permiss | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 4     | 4     | 0     | 8     | 8     | 8     | 5     | 5     | 2     | 0     | 0       | 6       | 6       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |       |       |         |         |         |
| Lead / Lag                   | Lead  | -     | -     | Lag   | -     | -     | Lead  | Lead  | -     | -     | -       | -       | -       |
| Minimum Green [s]            | 4     | 4     | 0     | 4     | 4     | 4     | 4     | 4     | 4     | 0     | 0       | 4       | 4       |
| Maximum Green [s]            | 30    | 30    | 0     | 17    | 17    | 17    | 11    | 11    | 60    | 0     | 0       | 46      | 46      |
| Amber [s]                    | 4.0   | 4.0   | 0.0   | 4.0   | 4.0   | 4.0   | 3.5   | 3.5   | 4.0   | 0.0   | 0.0     | 3.0     | 3.0     |
| All red [s]                  | 1.0   | 1.0   | 0.0   | 1.0   | 1.0   | 1.0   | 0.5   | 0.5   | 1.0   | 0.0   | 0.0     | 1.0     | 1.0     |
| Split [s]                    | 35    | 35    | 0     | 22    | 22    | 22    | 15    | 15    | 65    | 0     | 0       | 50      | 50      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 3.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0       | 0       | 0       |
| Rest In Walk                 | No    |       |       |       | No    |       |       |       | No    |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 3.0   | 2.0   | 2.0   | 3.0   | 0.0   | 0.0     | 2.0     | 2.0     |
| Minimum Recall               | No    |       |       |       | No    |       |       | No    | No    |       |         | No      |         |
| Maximum Recall               | No    |       |       |       | No    |       |       | No    | Yes   |       |         | Yes     |         |
| Pedestrian Recall            | No    |       |       |       | No    |       |       | No    | No    |       |         | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 30.0  | 30.0  | 30.0  | 0.0   | 0.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 104   | 104   | 104   | 104   | 104   | 104   | 104   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 4.00  | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 3.00  | 0.00  | 3.00  | 2.00  | 2.00  |
| g_i, Effective Green Time [s]           | 27    | 27    | 2     | 60    | 60    | 55    | 55    |
| g / C, Green / Cycle                    | 0.26  | 0.26  | 0.02  | 0.58  | 0.58  | 0.53  | 0.53  |
| (v / s)_i Volume / Saturation Flow Rate | 0.24  | 0.24  | 0.01  | 0.05  | 0.36  | 0.45  | 0.52  |
| s, saturation flow rate [veh/h]         | 1772  | 1775  | 1836  | 402   | 3547  | 1863  | 1612  |
| c, Capacity [veh/h]                     | 466   | 467   | 34    | 179   | 2038  | 982   | 850   |
| d1, Uniform Delay [s]                   | 37.18 | 37.30 | 50.87 | 24.18 | 14.84 | 21.07 | 24.09 |
| k, delay calibration                    | 0.31  | 0.31  | 0.11  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 15.99 | 17.28 | 16.15 | 1.34  | 1.50  | 8.94  | 25.97 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |       |        |        |        |
|---------------------------------------|--------|--------|-------|-------|--------|--------|--------|
| X, volume / capacity                  | 0.90   | 0.91   | 0.61  | 0.12  | 0.63   | 0.85   | 0.98   |
| d, Delay for Lane Group [s/veh]       | 53.18  | 54.58  | 67.02 | 25.51 | 16.34  | 30.00  | 50.06  |
| Lane Group LOS                        | D      | D      | E     | C     | B      | C      | D      |
| Critical Lane Group                   | No     | Yes    | Yes   | Yes   | No     | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 12.27  | 12.60  | 0.70  | 0.27  | 9.92   | 18.61  | 24.63  |
| 50th-Percentile Queue Length [ft/ln]  | 306.80 | 314.98 | 17.44 | 6.66  | 248.08 | 465.35 | 615.71 |
| 95th-Percentile Queue Length [veh/ln] | 18.02  | 18.42  | 1.26  | 0.48  | 15.09  | 25.69  | 32.77  |
| 95th-Percentile Queue Length [ft/ln]  | 450.43 | 460.52 | 31.39 | 11.99 | 377.23 | 642.23 | 819.18 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |       |       |       |       |       |       |      |       |       |
|---------------------------------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 53.82 | 0.00 | 54.58 | 67.02 | 67.02 | 67.02 | 25.51 | 25.51 | 16.34 | 0.00  | 0.00 | 32.13 | 50.06 |
| Movement LOS                    | D     |      | D     | E     | E     | E     | C     | C     | B     |       |      | C     | D     |
| d_A, Approach Delay [s/veh]     | 53.88 |      |       | 67.02 |       |       | 16.48 |       |       | 40.03 |      |       |       |
| Approach LOS                    | D     |      |       | E     |       |       | B     |       |       | D     |      |       |       |
| d_I, Intersection Delay [s/veh] | 35.22 |      |       |       |       |       |       |       |       |       |      |       |       |
| Intersection LOS                | D     |      |       |       |       |       |       |       |       |       |      |       |       |
| Intersection V/C                | 0.873 |      |       |       |       |       |       |       |       |       |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | 8 | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 31: Adelphi Rd/Campus Dr

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 180.6  
Level Of Service: F  
Volume to Capacity (v/c): 1.208

#### Intersection Setup

| Name                   | Adelphi Rd.                                                                       |        |        | Adelphi Rd.                                                                       |        |        | Campus Dr.                                                                          |        |        | Campus Dr.                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 1      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 350.00                                                                            | 100.00 | 500.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 250.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 40.00                                                                             |        |        | 40.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Adelphi Rd. |        |        | Adelphi Rd. |        |        | Campus Dr. |        |        | Campus Dr. |        |        |
|-----------------------------------------|-------------|--------|--------|-------------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 242         | 1536   | 43     | 174         | 1132   | 0      | 0          | 111    | 340    | 125        | 169    | 355    |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.27        | 2.08   | 2.27   | 2.00        | 2.05   | 0.00   | 0.00       | 2.00   | 2.21   | 2.00       | 2.00   | 2.00   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 15     | 0      | 0           | 28     | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 242         | 1551   | 43     | 174         | 1160   | 0      | 0          | 111    | 340    | 125        | 169    | 355    |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 1.0000 | 1.0000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 67          | 431    | 12     | 48          | 322    | 0      | 0          | 31     | 94     | 35         | 47     | 99     |
| Total Analysis Volume [veh/h]           | 269         | 1723   | 48     | 193         | 1289   | 0      | 0          | 123    | 378    | 139        | 188    | 394    |
| Presence of On-Street Parking           | No          |        | No     | No          |        | No     | No         |        | No     | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0           |        |        | 0          |        |        | 0          |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0           |        |        | 0          |        |        | 0          |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 248                          |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Overlap | Permiss | Permiss | Overlap | Overlap | Permiss | Permiss | Split | Split | Split | Split | Split |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|-------|-------|-------|-------|-------|
| Signal group                 | 3       | 8       | 8       | 1       | 1       | 0       | 0       | 2     | 2     | 6     | 6     | 6     |
| Auxiliary Signal Groups      | 3,8     |         |         | 1,7     | 1,4     |         |         |       |       |       |       |       |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | -       | -     | -     | Lag   | -     | -     |
| Minimum Green [s]            | 5       | 8       | 8       | 15      | 15      | 0       | 0       | 25    | 25    | 5     | 5     | 5     |
| Maximum Green [s]            | 30      | 60      | 60      | 40      | 40      | 0       | 0       | 60    | 60    | 30    | 30    | 30    |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 0.0     | 0.0     | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   |
| All red [s]                  | 1.0     | 2.0     | 2.0     | 1.0     | 1.0     | 0.0     | 0.0     | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   |
| Split [s]                    | 35      | 66      | 66      | 50      | 50      | 0       | 0       | 66    | 66    | 36    | 36    | 36    |
| Vehicle Extension [s]        | 3.0     | 3.5     | 3.5     | 3.0     | 3.0     | 0.0     | 0.0     | 4.0   | 4.0   | 3.0   | 3.0   | 3.0   |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0     | 0     | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0     | 0     | 0     | 0     | 0     |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No    |       |       | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 0.0     | 0.0     | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0     | 4.0     | 4.0     | 3.0     | 3.0     | 0.0     | 0.0     | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   |
| Minimum Recall               | Yes     | Yes     |         | Yes     | Yes     |         |         | Yes   |       |       | Yes   |       |
| Maximum Recall               | No      | No      |         | No      | No      |         |         | No    |       |       | No    |       |
| Pedestrian Recall            | No      | No      |         | No      | No      |         |         | No    |       |       | No    |       |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C      | R     | L     | C     | C     | R     | C       | C     | R      |
|-----------------------------------------|-------|--------|-------|-------|-------|-------|-------|---------|-------|--------|
| C, Cycle Length [s]                     | 215   | 215    | 215   | 215   | 215   | 215   | 215   | 215     | 215   | 215    |
| L, Total Lost Time per Cycle [s]        | 5.50  | 6.00   | 6.00  | 5.00  | 6.00  | 6.00  | 6.00  | 6.00    | 6.00  | 6.00   |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 2.00    | 0.00  | 0.00   |
| l2, Clearance Lost Time [s]             | 0.00  | 4.00   | 4.00  | 0.00  | 0.00  | 4.00  | 4.00  | 4.00    | 4.00  | 4.00   |
| g_i, Effective Green Time [s]           | 94    | 60     | 60    | 108   | 115   | 54    | 54    | 30      | 30    | 30     |
| g / C, Green / Cycle                    | 0.44  | 0.28   | 0.28  | 0.50  | 0.53  | 0.25  | 0.25  | 0.14    | 0.14  | 0.14   |
| (v / s)_i Volume / Saturation Flow Rate | 0.38  | 0.34   | 0.03  | 0.06  | 0.36  | 0.03  | 0.24  | 0.00    | 0.11  | 0.25   |
| s, saturation flow rate [veh/h]         | 702   | 5070   | 1579  | 3445  | 3545  | 3547  | 1580  | 0       | 1695  | 1583   |
| c, Capacity [veh/h]                     | 323   | 1414   | 440   | 1732  | 1891  | 893   | 398   | 33      | 236   | 221    |
| d1, Uniform Delay [s]                   | 83.05 | 77.56  | 57.68 | 28.19 | 36.82 | 62.40 | 79.17 | 107.56  | 89.59 | 92.56  |
| k, delay calibration                    | 0.50  | 0.13   | 0.13  | 0.11  | 0.50  | 0.15  | 0.36  | 0.11    | 0.27  | 0.50   |
| l, Upstream Filtering Factor            | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00  | 1.00   |
| d2, Incremental Delay [s]               | 21.43 | 100.14 | 0.13  | 0.03  | 2.01  | 0.10  | 28.05 | 1434.06 | 13.71 | 370.65 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00    | 0.00  | 0.00   |
| Rp, platoon ratio                       | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00  | 1.00   |
| PF, progression factor                  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00  | 1.00   |

**Lane Group Results**

|                                       |        |         |       |        |        |        |        |         |        |         |
|---------------------------------------|--------|---------|-------|--------|--------|--------|--------|---------|--------|---------|
| X, volume / capacity                  | 0.83   | 1.22    | 0.11  | 0.11   | 0.68   | 0.14   | 0.95   | 4.15    | 0.80   | 1.78    |
| d, Delay for Lane Group [s/veh]       | 104.48 | 177.70  | 57.81 | 28.22  | 38.83  | 62.50  | 107.22 | 1541.62 | 103.30 | 463.21  |
| Lane Group LOS                        | F      | F       | E     | C      | D      | E      | F      | F       | F      | F       |
| Critical Lane Group                   | No     | Yes     | No    | Yes    | Yes    | No     | Yes    | No      | No     | Yes     |
| 50th-Percentile Queue Length [veh/ln] | 11.54  | 39.07   | 1.98  | 2.70   | 25.36  | 2.66   | 23.76  | 15.23   | 11.11  | 35.12   |
| 50th-Percentile Queue Length [ft/ln]  | 288.61 | 976.64  | 49.54 | 67.60  | 634.12 | 66.53  | 593.91 | 380.66  | 277.66 | 877.94  |
| 95th-Percentile Queue Length [veh/ln] | 17.12  | 55.45   | 3.57  | 4.87   | 33.62  | 4.79   | 31.75  | 26.99   | 16.57  | 54.64   |
| 95th-Percentile Queue Length [ft/ln]  | 427.92 | 1386.21 | 89.17 | 121.68 | 840.61 | 119.75 | 793.75 | 674.69  | 414.29 | 1366.10 |



**Movement, Approach, & Intersection Results**

|                                 |        |        |       |       |       |      |       |       |        |         |        |        |
|---------------------------------|--------|--------|-------|-------|-------|------|-------|-------|--------|---------|--------|--------|
| d_M, Delay for Movement [s/veh] | 104.48 | 177.70 | 57.81 | 28.22 | 38.83 | 0.00 | 0.00  | 62.50 | 107.22 | 1541.62 | 103.30 | 463.21 |
| Movement LOS                    | F      | F      | E     | C     | D     |      |       | E     | F      | F       | F      | F      |
| d_A, Approach Delay [s/veh]     | 165.23 |        |       | 37.45 |       |      | 96.24 |       |        | 577.27  |        |        |
| Approach LOS                    | F      |        |       | D     |       |      | F     |       |        | F       |        |        |
| d_I, Intersection Delay [s/veh] | 180.65 |        |       |       |       |      |       |       |        |         |        |        |
| Intersection LOS                | F      |        |       |       |       |      |       |       |        |         |        |        |
| Intersection V/C                | 1.208  |        |       |       |       |      |       |       |        |         |        |        |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 6 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 5 | - | 8 | 7 | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 32: Adelphi Rd/Toledo Rd

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 9.7  
Level Of Service: A  
Volume to Capacity (v/c): 0.501

#### Intersection Setup

| Name                   | Adelphi Rd                                                                        |        |        | Adelphi Rd                                                                         |        | Toledo Rd                                                                           |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |        |  |        |  |        |
| Turning Movement       | U-turn                                                                            | Left   | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 0                                                                                  | 1      | 0                                                                                   | 1      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 200.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 30.00                                                                              |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        |        | No                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Adelphi Rd |        |        | Adelphi Rd |        | Toledo Rd |        |
|-----------------------------------------|------------|--------|--------|------------|--------|-----------|--------|
| Base Volume Input [veh/h]               | 6          | 122    | 1087   | 758        | 118    | 169       | 90     |
| Base Volume Adjustment Factor           | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000    | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00       | 1.97   | 2.01   | 2.05       | 1.88   | 2.38      | 1.96   |
| Growth Rate                             | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00      | 1.00   |
| In-Process Volume [veh/h]               | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Site-Generated Trips [veh/h]            | 0          | 0      | 7      | 18         | 0      | 0         | 0      |
| Diverted Trips [veh/h]                  | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Pass-by Trips [veh/h]                   | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Existing Site Adjustment Volume [veh/h] | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Other Volume [veh/h]                    | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Right-Turn on Red Volume [veh/h]        | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Total Hourly Volume [veh/h]             | 6          | 122    | 1094   | 776        | 118    | 169       | 90     |
| Peak Hour Factor                        | 0.9000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000    | 0.9000 |
| Other Adjustment Factor                 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000    | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2          | 34     | 304    | 216        | 33     | 47        | 25     |
| Total Analysis Volume [veh/h]           | 7          | 136    | 1216   | 862        | 131    | 188       | 100    |
| Presence of On-Street Parking           | No         |        | No     | No         | No     | No        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Local Bus Stopping Rate [/h]            | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Pedestrian Volume [ped/h]               | 6          |        |        | 0          |        | 6         |        |
| Bicycle Volume [bicycles/h]             | 0          |        |        | 0          |        | 0         |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 100            |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 20.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 9.00           |

**Phasing & Timing**

| Control Type                 | Permissive | ProtectedP | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 5          | 5          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |            |       |       |
| Lead / Lag                   | Lead       | Lead       | -          | -          | -          | Lag   | -     |
| Minimum Green [s]            | 4          | 4          | 4          | 4          | 4          | 4     | 4     |
| Maximum Green [s]            | 15         | 15         | 65         | 45         | 45         | 25    | 25    |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 4.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 30         | 30         | 30         | 30         | 30         | 30    | 30    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 0          | 0          | 7          | 7          | 7          | 7     | 7     |
| Pedestrian Clearance [s]     | 0          | 0          | 6          | 6          | 6          | 13    | 13    |
| Rest In Walk                 |            |            | No         | No         |            | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Minimum Recall               |            | No         | No         | No         |            | No    |       |
| Maximum Recall               |            | No         | Yes        | Yes        |            | No    |       |
| Pedestrian Recall            |            | No         | No         | No         |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 30.0       | 30.0       | 30.0       | 30.0       | 30.0       | 30.0  | 30.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | R    | L     | R     |
|-----------------------------------------|------|------|------|------|-------|-------|
| C, Cycle Length [s]                     | 87   | 87   | 87   | 87   | 87    | 87    |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00 | 3.00 | 3.00 | 3.00 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 65   | 65   | 56   | 56   | 12    | 12    |
| g / C, Green / Cycle                    | 0.74 | 0.74 | 0.64 | 0.64 | 0.14  | 0.14  |
| (v / s)_i Volume / Saturation Flow Rate | 0.19 | 0.34 | 0.24 | 0.08 | 0.11  | 0.06  |
| s, saturation flow rate [veh/h]         | 766  | 3546 | 3545 | 1578 | 1767  | 1564  |
| c, Capacity [veh/h]                     | 612  | 2637 | 2261 | 1006 | 251   | 222   |
| d1, Uniform Delay [s]                   | 4.02 | 4.38 | 7.57 | 6.25 | 36.00 | 34.37 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.89 | 0.58 | 0.49 | 0.27 | 4.43  | 1.42  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |       |
|---------------------------------------|-------|--------|--------|-------|--------|-------|
| X, volume / capacity                  | 0.23  | 0.46   | 0.38   | 0.13  | 0.75   | 0.45  |
| d, Delay for Lane Group [s/veh]       | 4.91  | 4.96   | 8.06   | 6.52  | 40.43  | 35.79 |
| Lane Group LOS                        | A     | A      | A      | A     | D      | D     |
| Critical Lane Group                   | No    | Yes    | No     | No    | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.56  | 2.66   | 3.50   | 0.91  | 4.09   | 2.01  |
| 50th-Percentile Queue Length [ft/ln]  | 14.10 | 66.62  | 87.50  | 22.86 | 102.14 | 50.13 |
| 95th-Percentile Queue Length [veh/ln] | 1.02  | 4.80   | 6.30   | 1.65  | 7.35   | 3.61  |
| 95th-Percentile Queue Length [ft/ln]  | 25.38 | 119.92 | 157.50 | 41.14 | 183.85 | 90.24 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |      |       |       |
|---------------------------------|-------|------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 4.91  | 4.91 | 4.96 | 8.06 | 6.52 | 40.43 | 35.79 |
| Movement LOS                    | A     | A    | A    | A    | A    | D     | D     |
| d_A, Approach Delay [s/veh]     | 4.95  |      |      | 7.86 |      | 38.82 |       |
| Approach LOS                    | A     |      |      | A    |      | D     |       |
| d_I, Intersection Delay [s/veh] | 9.74  |      |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |      |       |       |
| Intersection V/C                | 0.501 |      |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 33: Hamilton St/40th Pl/39th Ave

Control Type: Roundabout  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 8.9  
 Level Of Service: A

#### Intersection Setup

| Name                   | Magruder Park Ent |        |        |        | 39th Ave   |        |        |        | Hamilton St |        |        |        |
|------------------------|-------------------|--------|--------|--------|------------|--------|--------|--------|-------------|--------|--------|--------|
| Approach               | Northbound        |        |        |        | Southbound |        |        |        | Eastbound   |        |        |        |
| Lane Configuration     |                   |        |        |        |            |        |        |        |             |        |        |        |
| Turning Movement       | Left              | Thru   | Right  | Right2 | Left2      | Left   | Thru   | Right  | Left2       | Left   | Thru   | Right  |
| Lane Width [ft]        | 12.00             | 12.00  | 12.00  | 12.00  | 12.00      | 12.00  | 12.00  | 12.00  | 12.00       | 12.00  | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                 | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pocket Length [ft]     | 100.00            | 100.00 | 100.00 | 100.00 | 100.00     | 100.00 | 100.00 | 100.00 | 100.00      | 100.00 | 100.00 | 100.00 |
| Speed [mph]            | 30.00             |        |        |        | 30.00      |        |        |        | 35.00       |        |        |        |
| Grade [%]              | 0.00              |        |        |        | 0.00       |        |        |        | 0.00        |        |        |        |
| Crosswalk              | Yes               |        |        |        | Yes        |        |        |        | Yes         |        |        |        |

#### Volumes

| Name                                    | Magruder Park Ent |        |        |        | 39th Ave |        |        |        | Hamilton St |        |        |        |
|-----------------------------------------|-------------------|--------|--------|--------|----------|--------|--------|--------|-------------|--------|--------|--------|
| Base Volume Input [veh/h]               | 18                | 8      | 0      | 2      | 0        | 21     | 16     | 46     | 22          | 0      | 418    | 25     |
| Base Volume Adjustment Factor           | 1.0000            | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00              | 0.00   | 0.00   | 0.00   | 0.00     | 0.00   | 0.00   | 0.00   | 3.85        | 0.00   | 2.15   | 0.00   |
| Growth Rate                             | 1.00              | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 7      | 0      |
| Diverted Trips [veh/h]                  | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 18                | 8      | 0      | 2      | 0        | 21     | 16     | 46     | 22          | 0      | 425    | 25     |
| Peak Hour Factor                        | 0.9000            | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000            | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 5                 | 2      | 0      | 1      | 0        | 6      | 4      | 13     | 6           | 0      | 118    | 7      |
| Total Analysis Volume [veh/h]           | 20                | 9      | 0      | 2      | 0        | 23     | 18     | 51     | 24          | 0      | 472    | 28     |
| Pedestrian Volume [ped/h]               | 0                 |        |        |        | 0        |        |        |        | 0           |        |        |        |

**Intersection Settings**

|                                         |     |   |   |   |     |    |    |    |     |   |     |    |
|-----------------------------------------|-----|---|---|---|-----|----|----|----|-----|---|-----|----|
| Number of Conflicting Circulating Lanes | 1   |   |   |   | 1   |    |    |    | 1   |   |     |    |
| Circulating Flow Rate [veh/h]           | 530 |   |   |   | 609 |    |    |    | 52  |   |     |    |
| Exiting Flow Rate [veh/h]               | 57  |   |   |   | 49  |    |    |    | 649 |   |     |    |
| Demand Flow Rate [veh/h]                | 18  | 8 | 0 | 2 | 0   | 21 | 16 | 46 | 22  | 0 | 425 | 25 |
| Adjusted Demand Flow Rate [veh/h]       | 20  | 9 | 0 | 2 | 0   | 23 | 18 | 51 | 24  | 0 | 472 | 28 |

**Lanes**

|                                            |         |  |  |  |         |  |  |  |         |  |  |  |
|--------------------------------------------|---------|--|--|--|---------|--|--|--|---------|--|--|--|
| Overwrite Calculated Critical Headway      | No      |  |  |  | No      |  |  |  | No      |  |  |  |
| User-Defined Critical Headway [s]          | 4.00    |  |  |  | 4.00    |  |  |  | 4.00    |  |  |  |
| Overwrite Calculated Follow-Up Time        | No      |  |  |  | No      |  |  |  | No      |  |  |  |
| User-Defined Follow-Up Time [s]            | 3.00    |  |  |  | 3.00    |  |  |  | 3.00    |  |  |  |
| A (intercept)                              | 1130.00 |  |  |  | 1130.00 |  |  |  | 1130.00 |  |  |  |
| B (coefficient)                            | 0.00100 |  |  |  | 0.00100 |  |  |  | 0.00100 |  |  |  |
| HV Adjustment Factor                       | 1.00    |  |  |  | 1.00    |  |  |  | 0.98    |  |  |  |
| Entry Flow Rate [veh/h]                    | 31      |  |  |  | 92      |  |  |  | 536     |  |  |  |
| Capacity of Entry and Bypass Lanes [veh/h] | 666     |  |  |  | 615     |  |  |  | 1073    |  |  |  |
| Pedestrian Impedance                       | 1.00    |  |  |  | 1.00    |  |  |  | 1.00    |  |  |  |
| Capacity per Entry Lane [veh/h]            | 666     |  |  |  | 615     |  |  |  | 1051    |  |  |  |
| X, volume / capacity                       | 0.05    |  |  |  | 0.15    |  |  |  | 0.50    |  |  |  |

**Movement, Approach, & Intersection Results**

|                                    |      |       |       |
|------------------------------------|------|-------|-------|
| Lane LOS                           | A    | A     | A     |
| 95th-Percentile Queue Length [veh] | 0.15 | 0.52  | 2.86  |
| 95th-Percentile Queue Length [ft]  | 3.66 | 13.10 | 71.53 |
| Approach Delay [s/veh]             | 5.91 | 7.64  | 9.28  |
| Approach LOS                       | A    | A     | A     |
| Intersection Delay [s/veh]         | 8.87 |       |       |
| Intersection LOS                   | A    |       |       |

**Intersection Setup**

| Name                   | Hamilton St                                                                       |        |        |        | Gallatin St                                                                         |        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|--------|
| Approach               | Westbound                                                                         |        |        |        | Northwestbound                                                                      |        |        |        |
| Lane Configuration     |  |        |        |        |  |        |        |        |
| Turning Movement       | Left2                                                                             | Left   | Thru   | Right  | Left                                                                                | Thru   | Right  | Right2 |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0      | 0                                                                                   | 0      | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        |        | 35.00                                                                               |        |        |        |
| Grade [%]              | 0.00                                                                              |        |        |        | 0.00                                                                                |        |        |        |
| Crosswalk              | Yes                                                                               |        |        |        | Yes                                                                                 |        |        |        |

**Volumes**

| Name                                    | Hamilton St |        |        |        | Gallatin St |        |        |        |
|-----------------------------------------|-------------|--------|--------|--------|-------------|--------|--------|--------|
| Base Volume Input [veh/h]               | 0           | 0      | 67     | 5      | 10          | 431    | 8      | 0      |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00        | 0.00   | 2.20   | 0.00   | 0.00        | 2.18   | 0.00   | 0.00   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 0      | 0      | 0      | 0           | 12     | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0           | 0      | 67     | 5      | 10          | 443    | 8      | 0      |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0           | 0      | 19     | 1      | 3           | 123    | 2      | 0      |
| Total Analysis Volume [veh/h]           | 0           | 0      | 74     | 6      | 11          | 492    | 9      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        |        | 0           |        |        |        |



**Intersection Settings**

|                                         |     |   |    |   |     |     |   |   |
|-----------------------------------------|-----|---|----|---|-----|-----|---|---|
| Number of Conflicting Circulating Lanes | 1   |   |    |   | 1   |     |   |   |
| Circulating Flow Rate [veh/h]           | 577 |   |    |   | 54  |     |   |   |
| Exiting Flow Rate [veh/h]               | 0   |   |    |   | 507 |     |   |   |
| Demand Flow Rate [veh/h]                | 0   | 0 | 67 | 5 | 10  | 443 | 8 | 0 |
| Adjusted Demand Flow Rate [veh/h]       | 0   | 0 | 74 | 6 | 11  | 492 | 9 | 0 |

**Lanes**

|                                            |         |  |  |  |         |  |  |  |
|--------------------------------------------|---------|--|--|--|---------|--|--|--|
| Overwrite Calculated Critical Headway      | No      |  |  |  | No      |  |  |  |
| User-Defined Critical Headway [s]          | 4.00    |  |  |  | 4.00    |  |  |  |
| Overwrite Calculated Follow-Up Time        | No      |  |  |  | No      |  |  |  |
| User-Defined Follow-Up Time [s]            | 3.00    |  |  |  | 3.00    |  |  |  |
| A (intercept)                              | 1130.00 |  |  |  | 1130.00 |  |  |  |
| B (coefficient)                            | 0.00100 |  |  |  | 0.00100 |  |  |  |
| HV Adjustment Factor                       | 0.98    |  |  |  | 0.98    |  |  |  |
| Entry Flow Rate [veh/h]                    | 82      |  |  |  | 523     |  |  |  |
| Capacity of Entry and Bypass Lanes [veh/h] | 635     |  |  |  | 1071    |  |  |  |
| Pedestrian Impedance                       | 1.00    |  |  |  | 1.00    |  |  |  |
| Capacity per Entry Lane [veh/h]            | 623     |  |  |  | 1049    |  |  |  |
| X, volume / capacity                       | 0.13    |  |  |  | 0.49    |  |  |  |

**Movement, Approach, & Intersection Results**

|                                    |       |  |  |  |       |  |  |  |
|------------------------------------|-------|--|--|--|-------|--|--|--|
| Lane LOS                           | A     |  |  |  | A     |  |  |  |
| 95th-Percentile Queue Length [veh] | 0.44  |  |  |  | 2.75  |  |  |  |
| 95th-Percentile Queue Length [ft]  | 11.00 |  |  |  | 68.73 |  |  |  |
| Approach Delay [s/veh]             | 7.28  |  |  |  | 9.10  |  |  |  |
| Approach LOS                       | A     |  |  |  | A     |  |  |  |
| Intersection Delay [s/veh]         | 8.87  |  |  |  |       |  |  |  |
| Intersection LOS                   | A     |  |  |  |       |  |  |  |

### Intersection Level Of Service Report

#### Intersection 4302: New Intersection

Control Type: Two-way stop  
 Analysis Method: HCM 6th Edition  
 Analysis Period: 15 minutes

Delay (sec / veh): 14.9  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.000

#### Intersection Setup

| Name                   |                                                                                   |        |        |                                                                                   |        |        | Queensbury                                                                          |        |        | Queensbury                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        |        |        |        | Queensbury |        |        | Queensbury |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 363    | 0      | 0          | 319    | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00       | 2.00   | 2.00   | 2.00       | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 363    | 0      | 0          | 319    | 0      |
| Peak Hour Factor                        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 91     | 0      | 0          | 80     | 0      |
| Total Analysis Volume [veh/h]           | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 363    | 0      | 0          | 319    | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 0          |        |        | 0          |        |        |

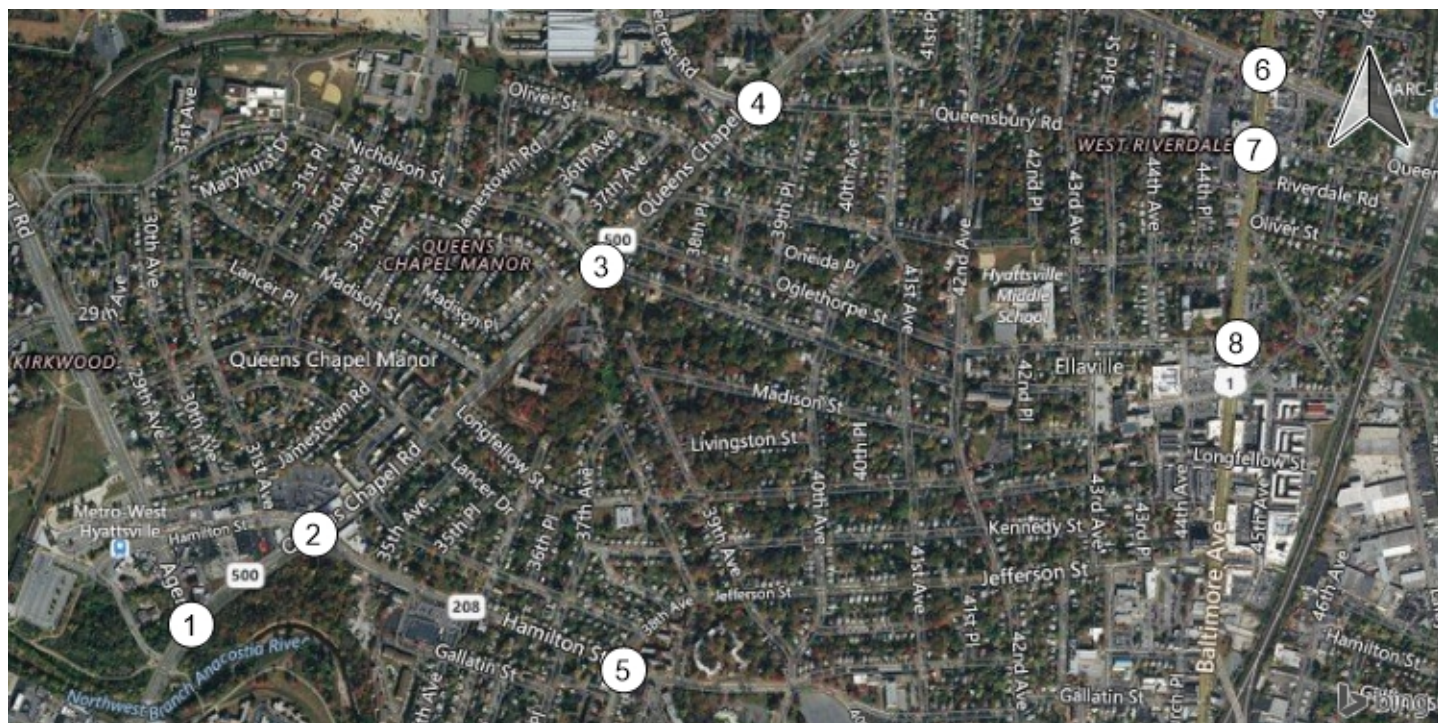
**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Stop | Stop | Free | Free |
| Flared Lane                        | No   | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

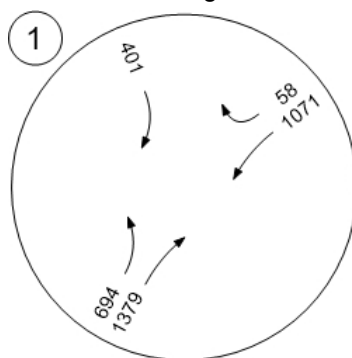
**Movement, Approach, & Intersection Results**

|                                       |       |       |       |       |       |      |      |      |      |      |      |      |
|---------------------------------------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 14.89 | 14.67 | 10.28 | 14.89 | 14.67 | 9.99 | 7.90 | 0.00 | 0.00 | 8.01 | 0.00 | 0.00 |
| Movement LOS                          | B     | B     | B     | B     | B     | A    | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 13.28 |       |       | 13.19 |       |      | 0.00 |      |      | 0.00 |      |      |
| Approach LOS                          | B     |       |       | B     |       |      | A    |      |      | A    |      |      |
| d_I, Intersection Delay [s/veh]       | 0.00  |       |       |       |       |      |      |      |      |      |      |      |
| Intersection LOS                      | B     |       |       |       |       |      |      |      |      |      |      |      |

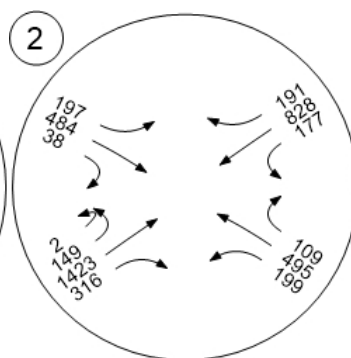
## Traffic Volume - Future Total Volume



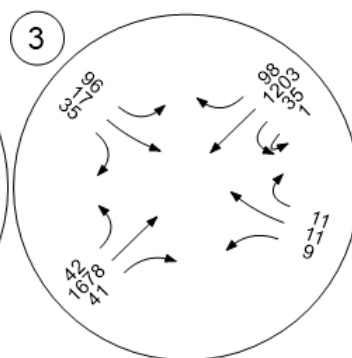
MD 500/Ager Rd



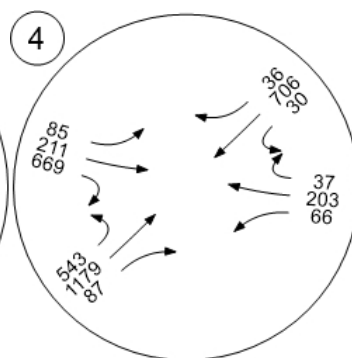
MD 500/Hamilton St



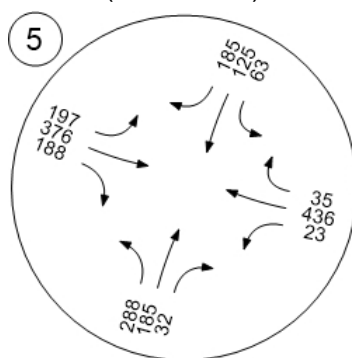
MD 500/Nicholson St



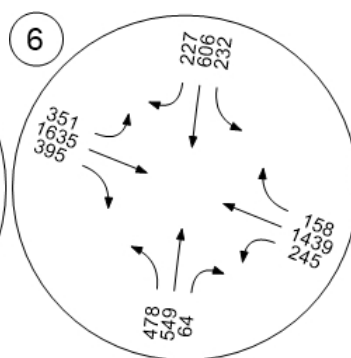
MD 500/Belcrest Rd/Queens



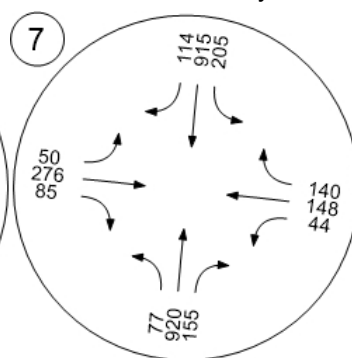
MD 208(Hamilton St)/38th Av



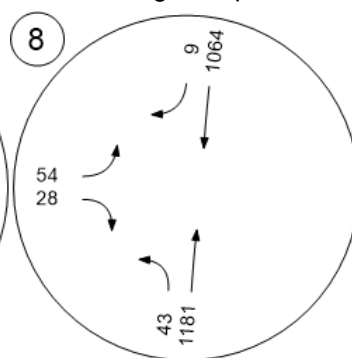
US 1/MD 410



US 1/Queensbury Rd

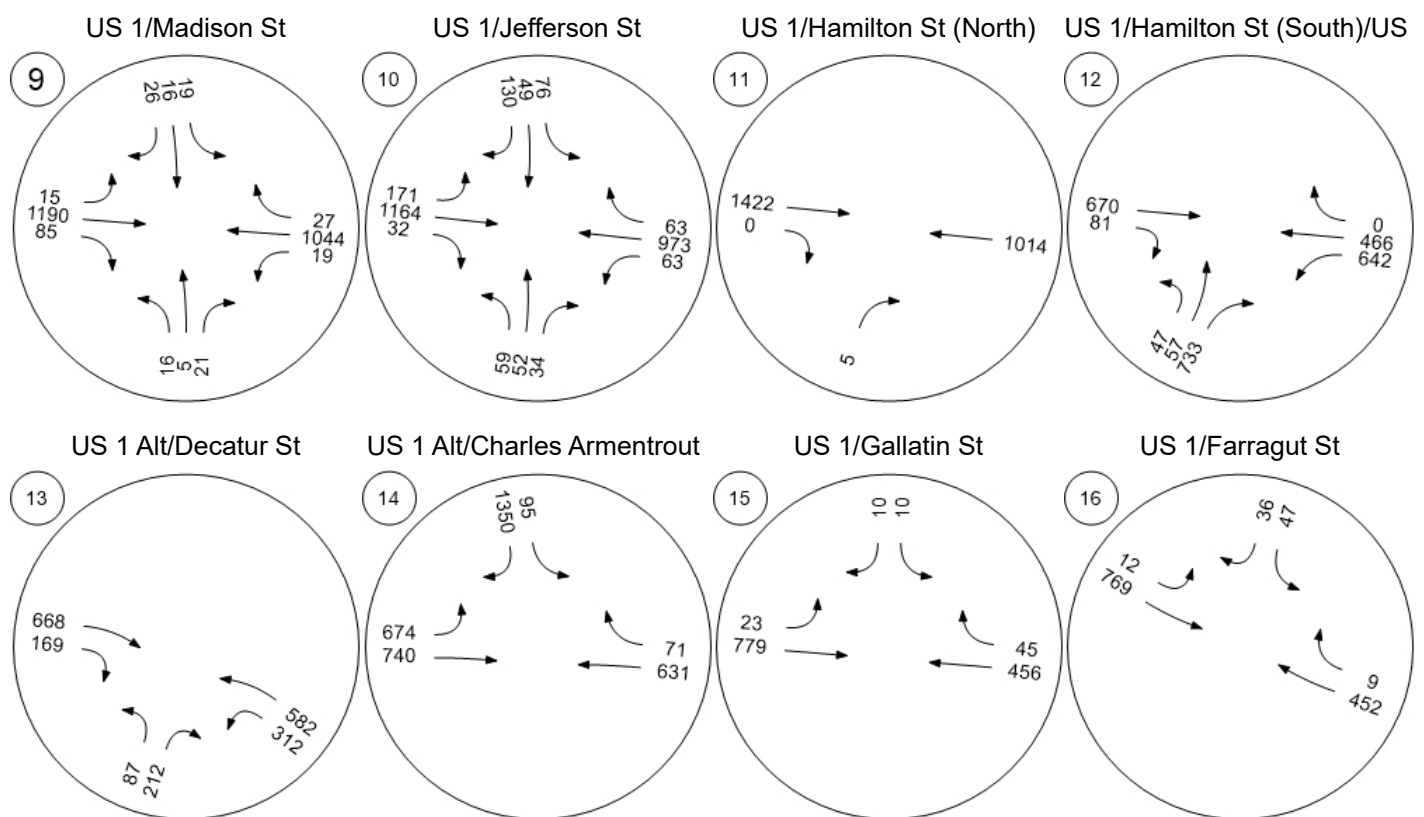


US 1/Oglethorpe Rd



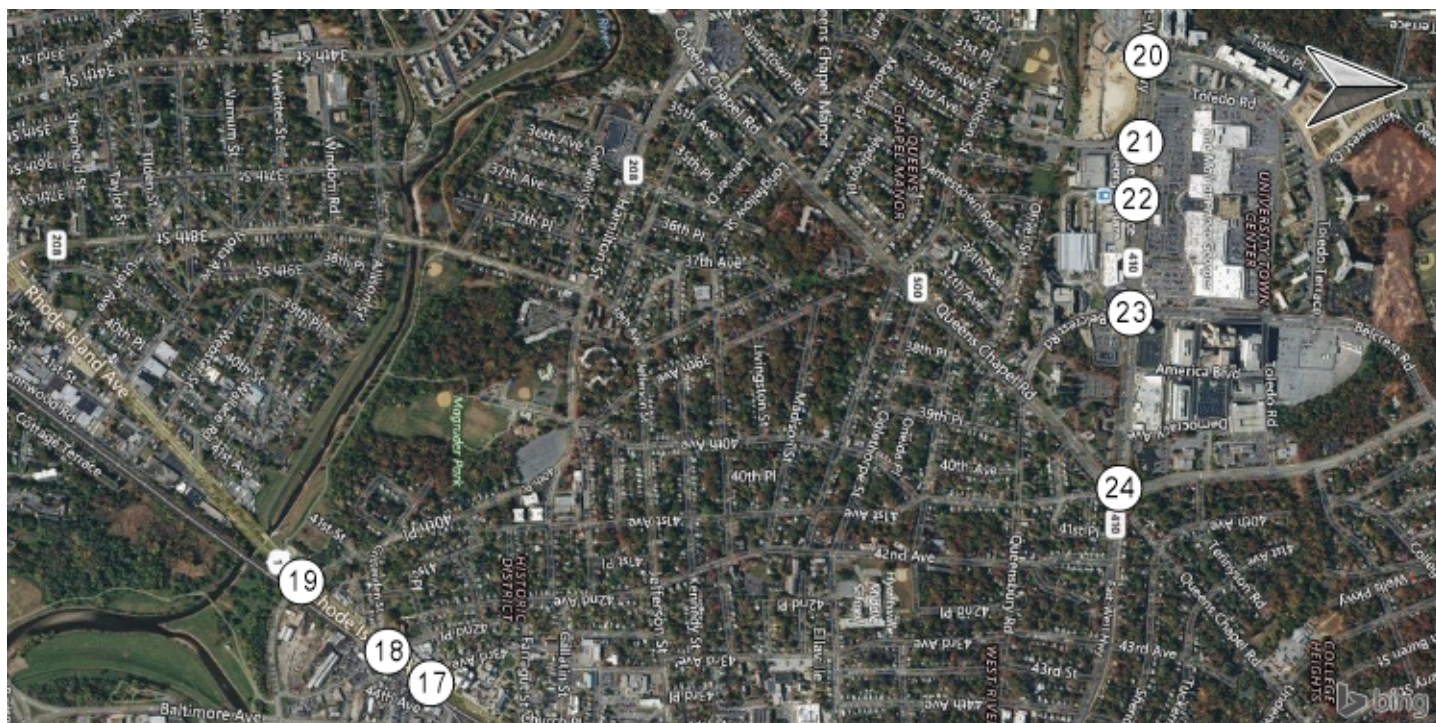


# Traffic Volume - Future Total Volume

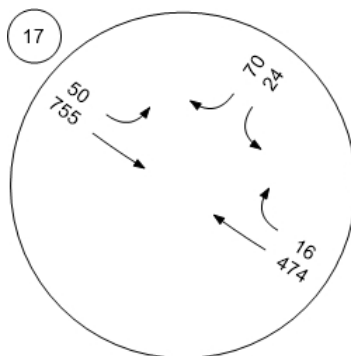




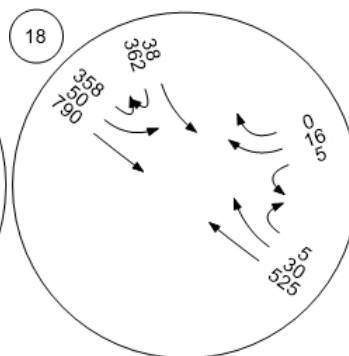
## Traffic Volume - Future Total Volume



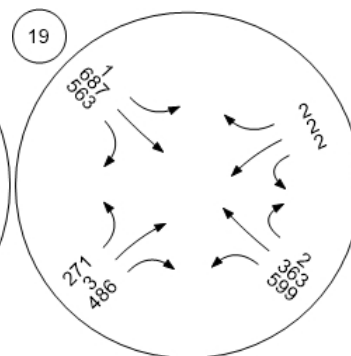
US 1/43rd Ave



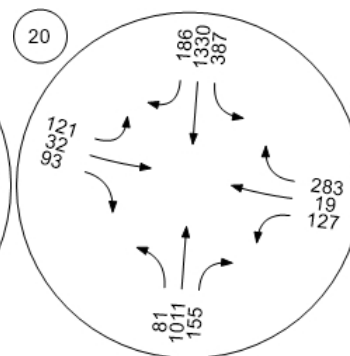
US 1/42nd Place/Crittendon



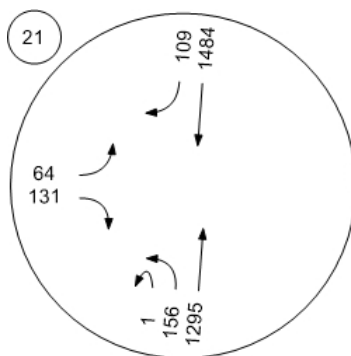
US 1/41st Place/Charles Arm



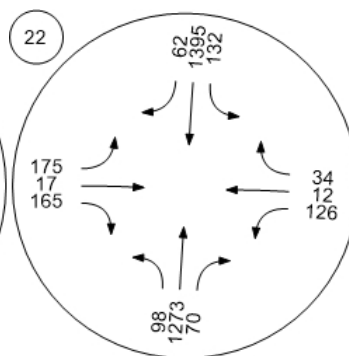
MD 410/Toledo Terrace



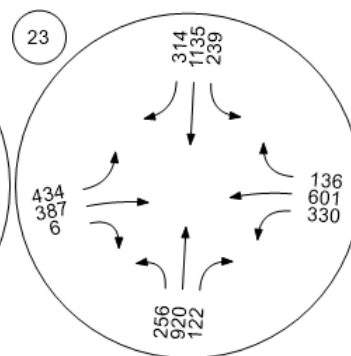
MD 410/Editors Park Dr



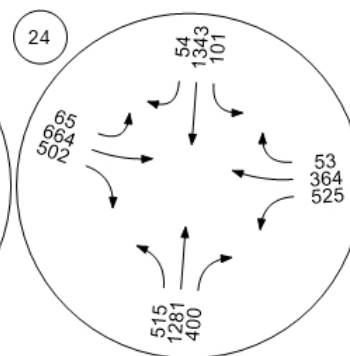
MD 410/Prince George's Plaz



MD 410/Belcrest Rd

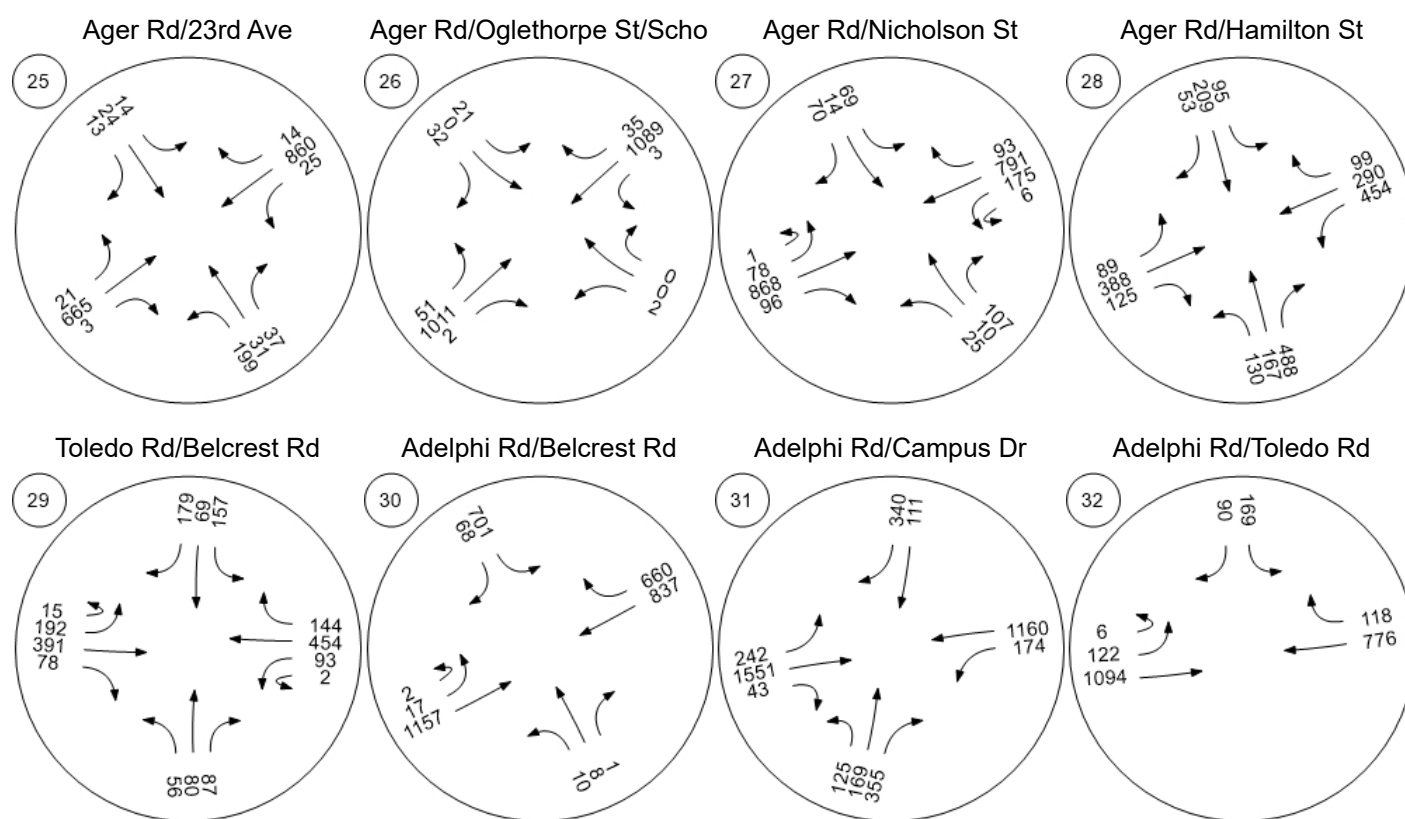
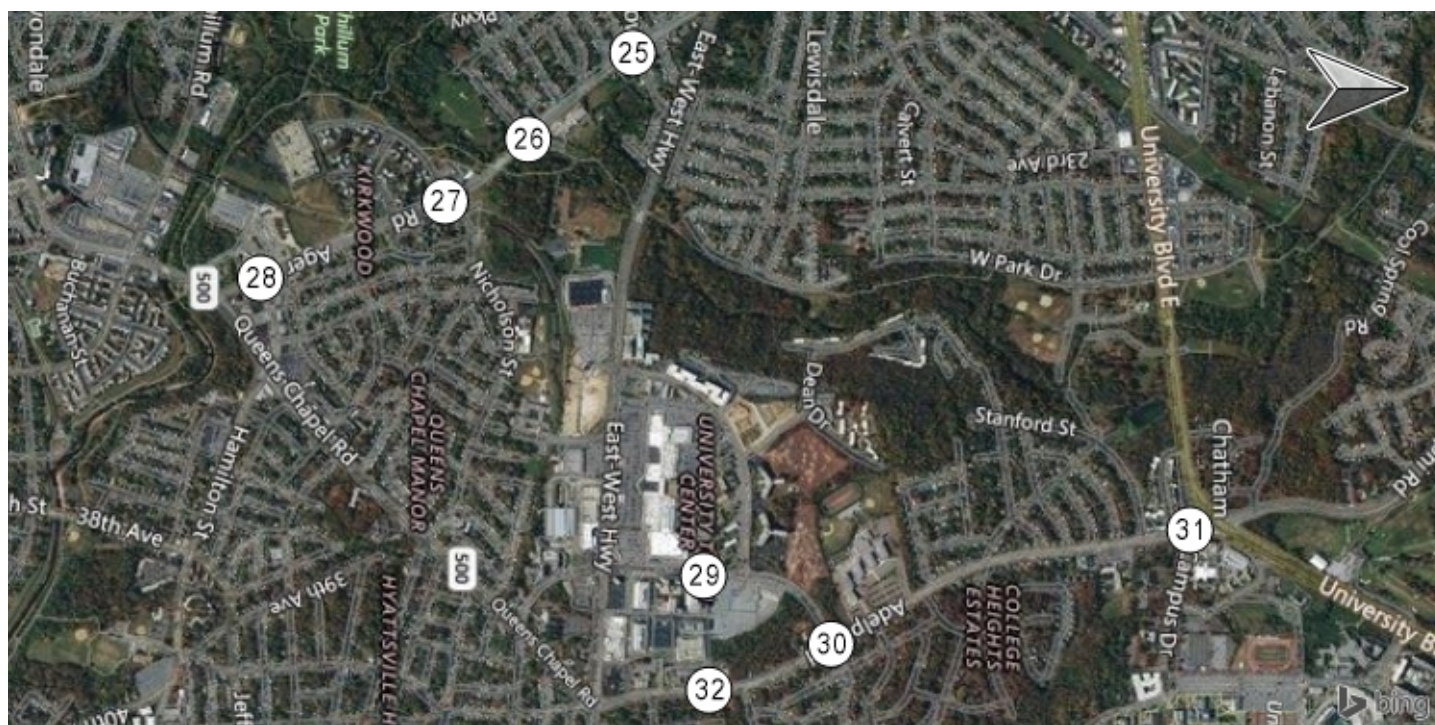


MD 410/MD 500/Adelphi Rd

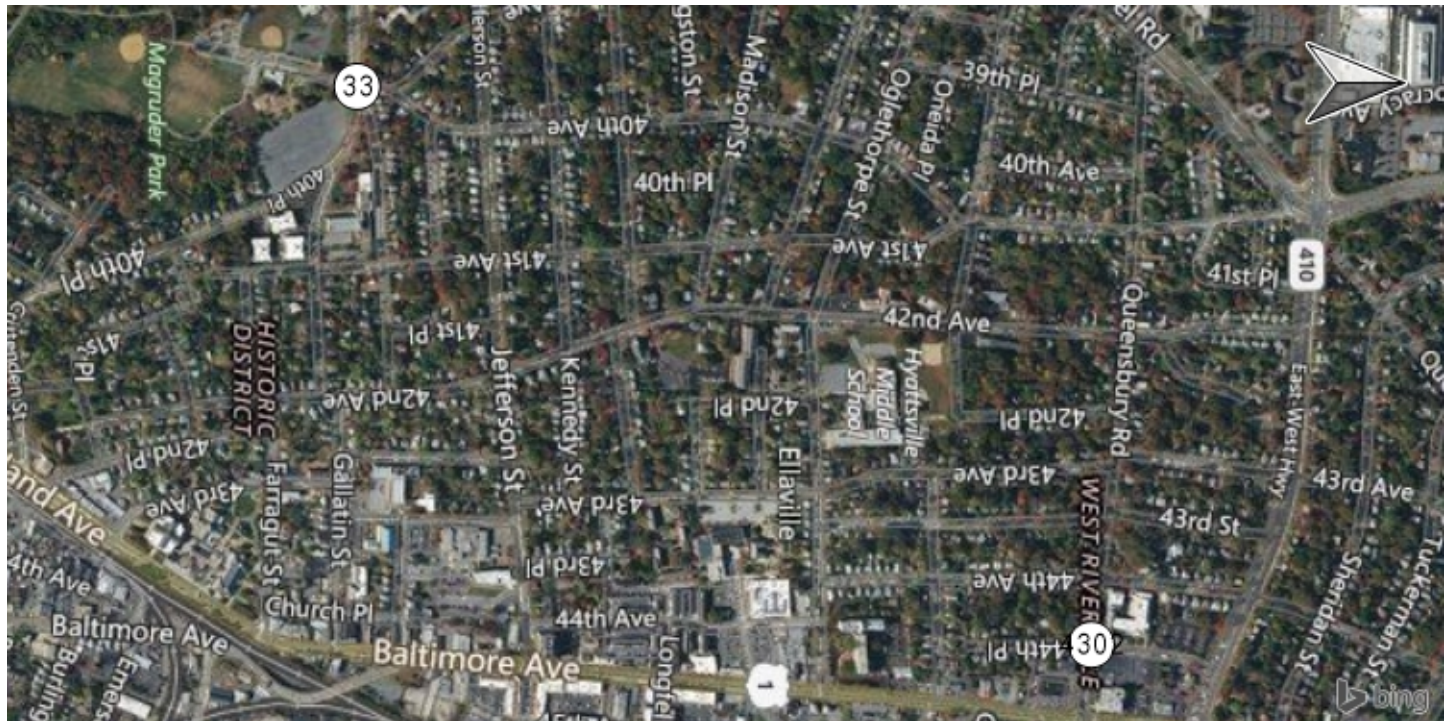




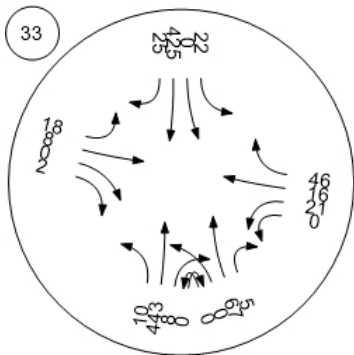
## Traffic Volume - Future Total Volume



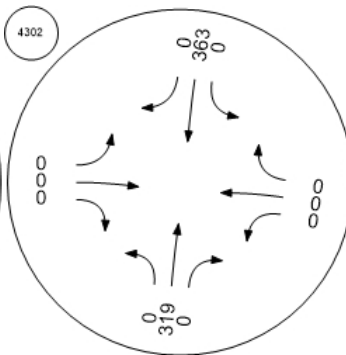
Traffic Volume - Future Total Volume



Hamilton St/40th Pl/39th Ave

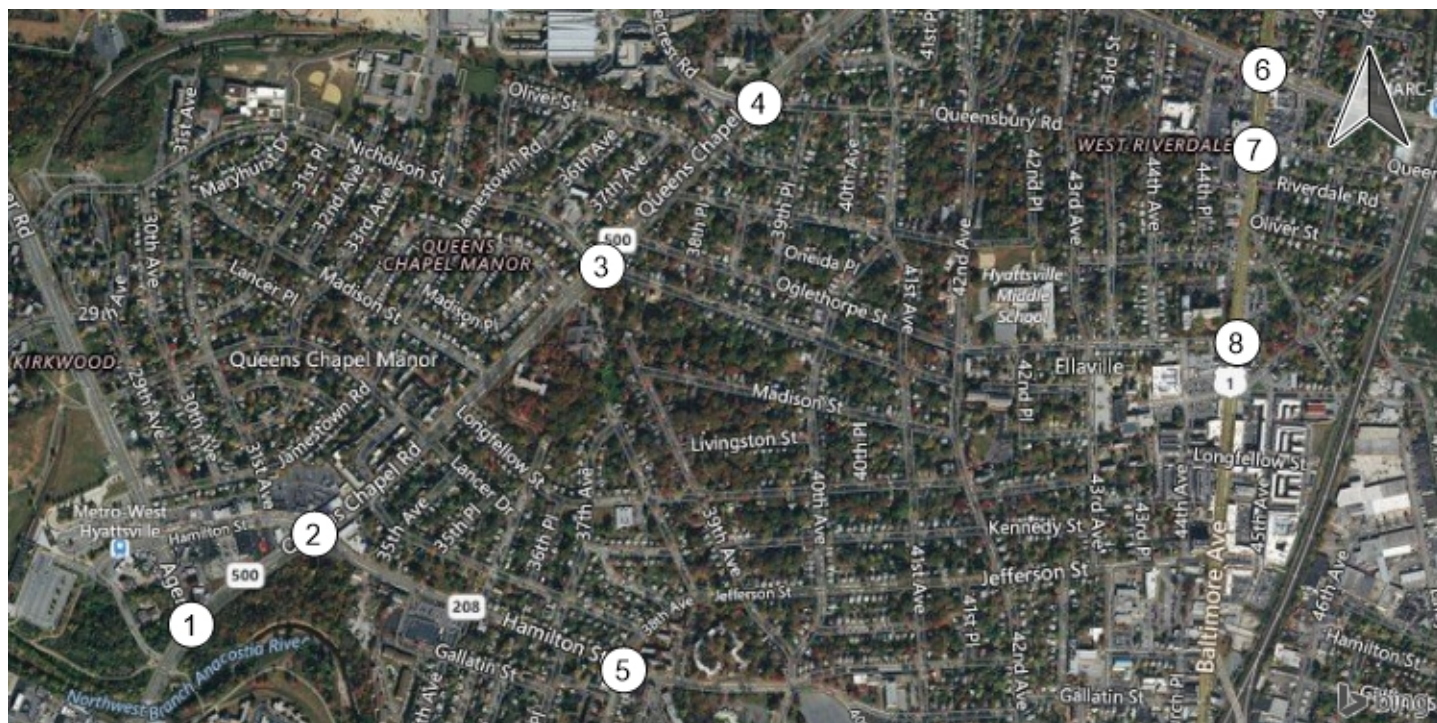


New Intersection

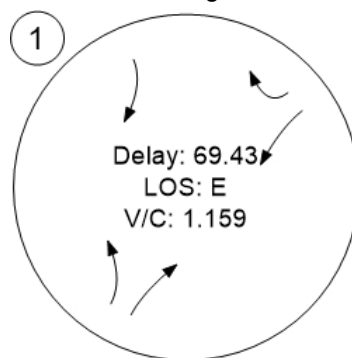




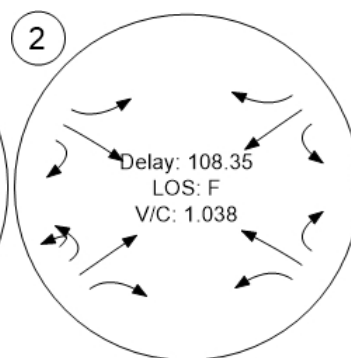
## Traffic Conditions



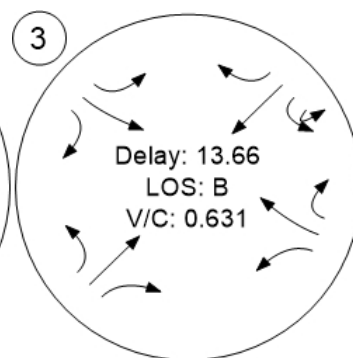
MD 500/Ager Rd



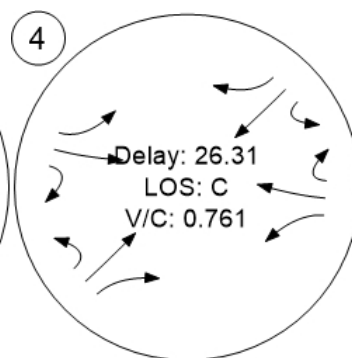
MD 500/Hamilton St



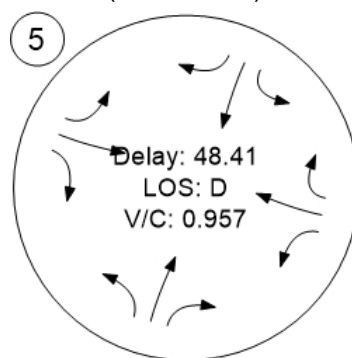
MD 500/Nicholson St



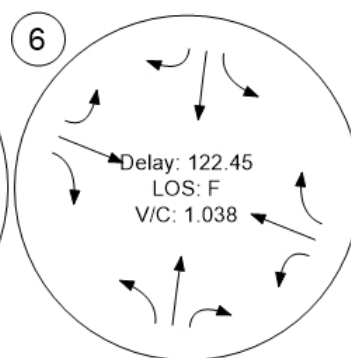
MD 500/Belcrest Rd/Queens



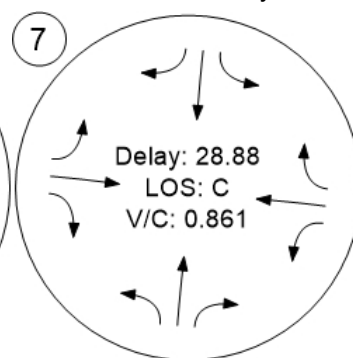
MD 208(Hamilton St)/38th Av



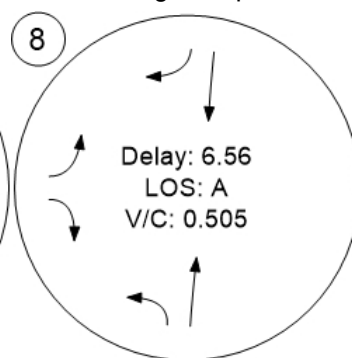
US 1/MD 410



US 1/Queensbury Rd

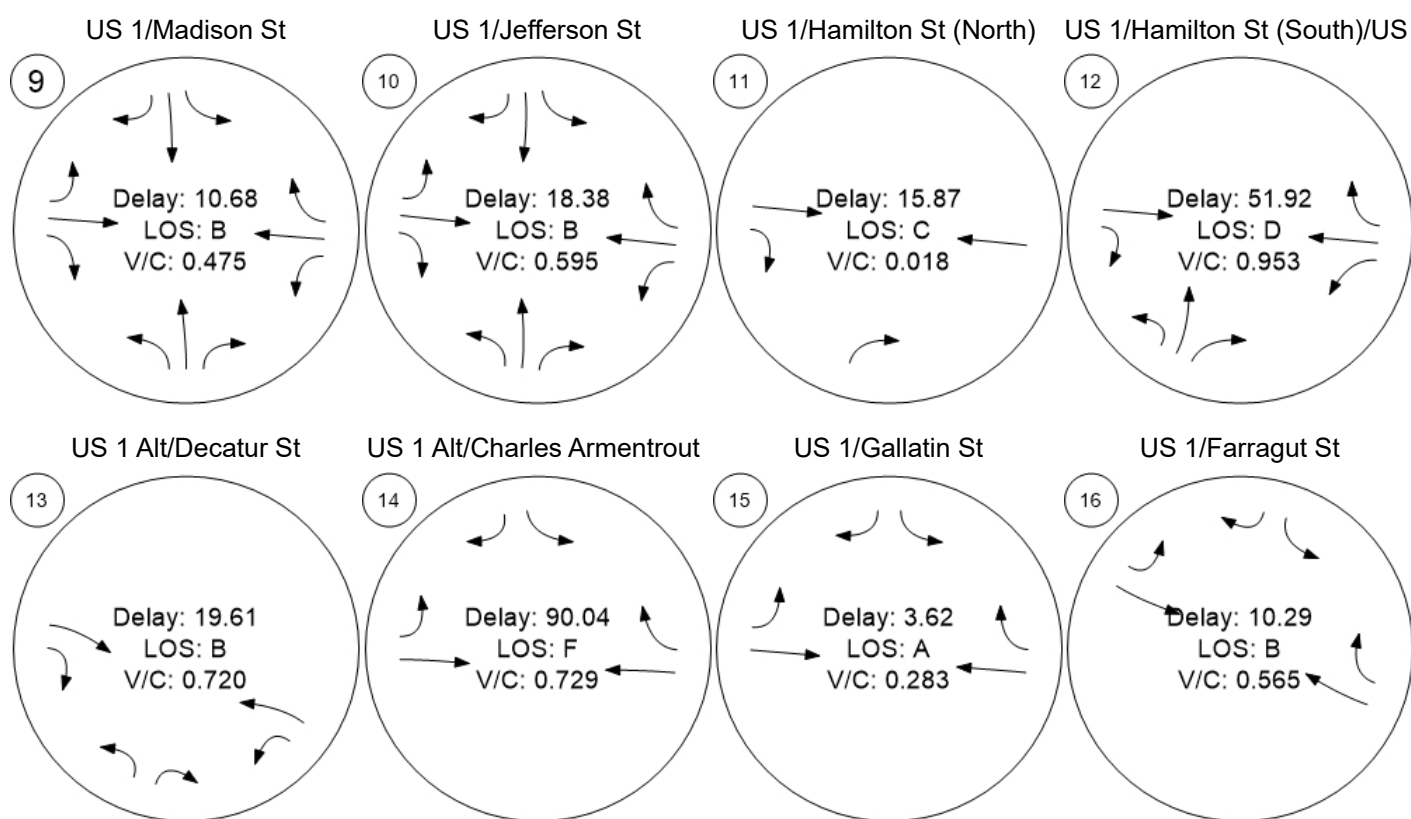
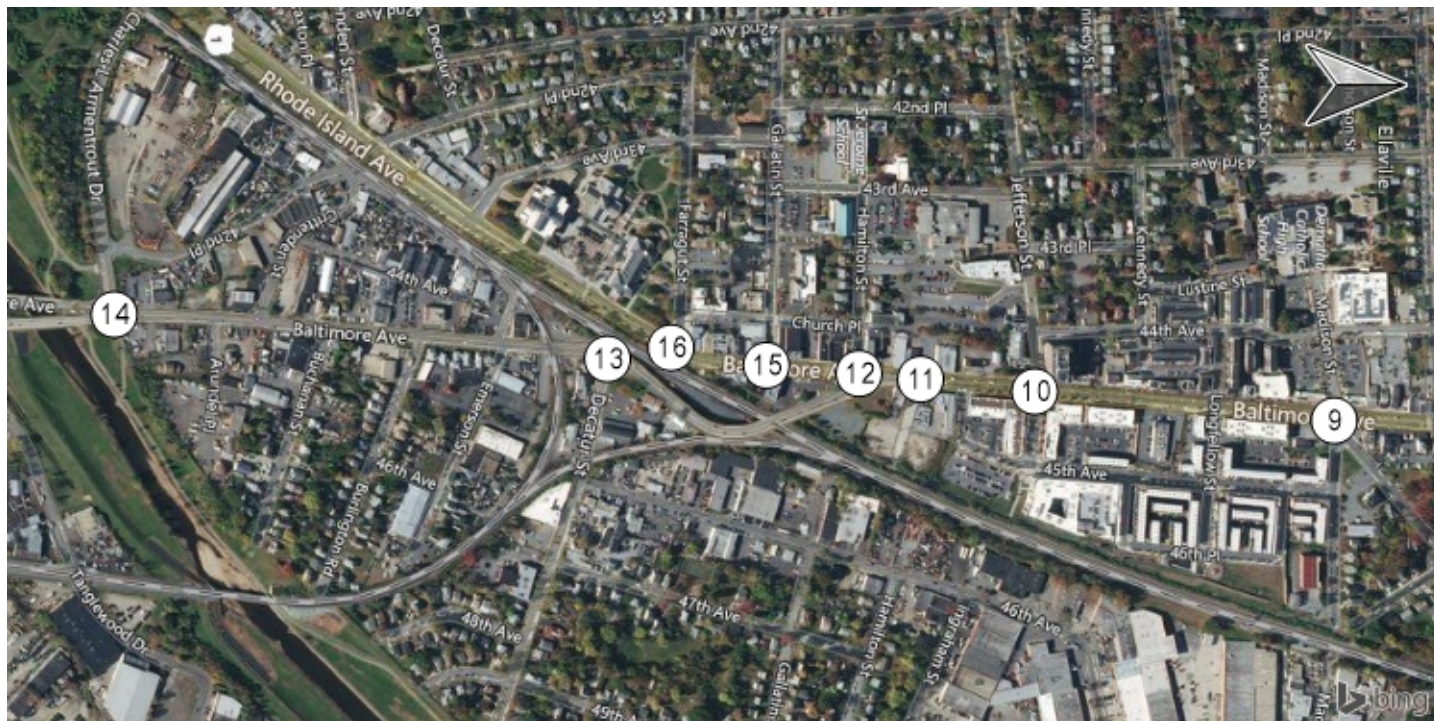


US 1/Oglethorpe Rd



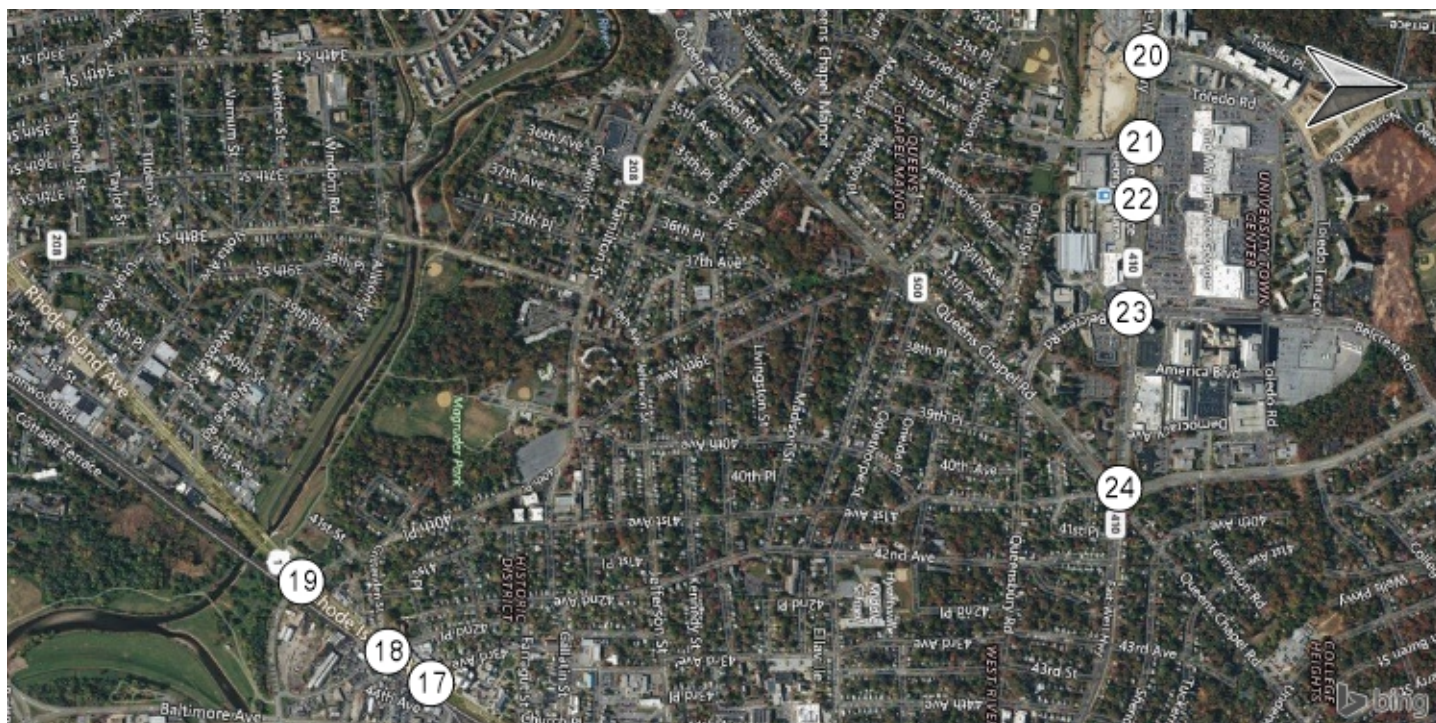


## Traffic Conditions

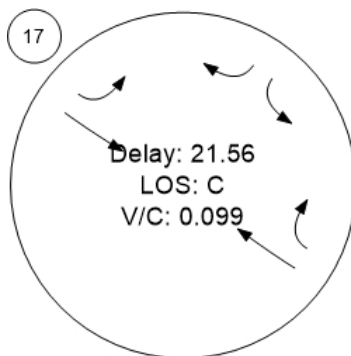




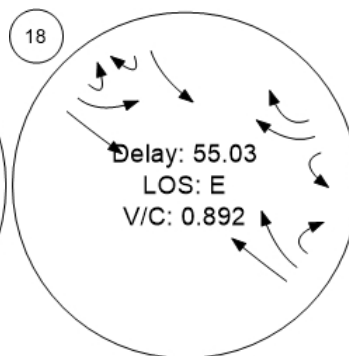
## Traffic Conditions



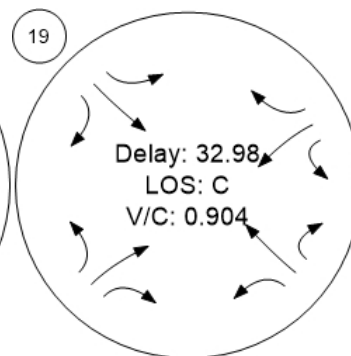
US 1/43rd Ave



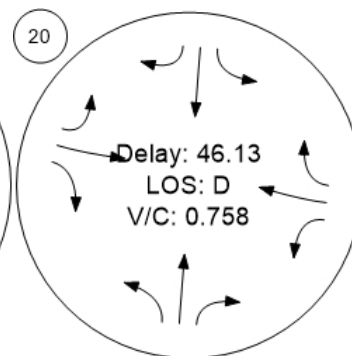
US 1/42nd Place/Crittendon



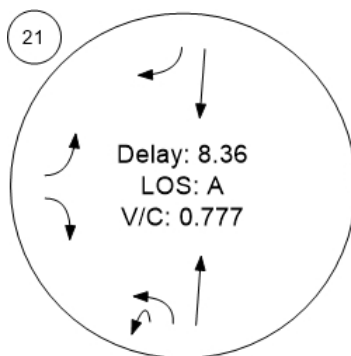
US 1/41st Place/Charles Arm



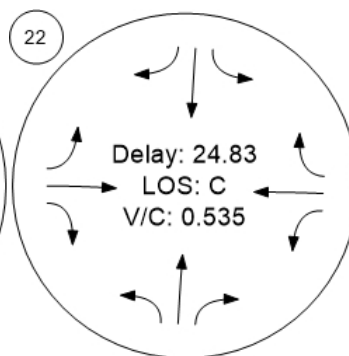
MD 410/Toledo Terrace



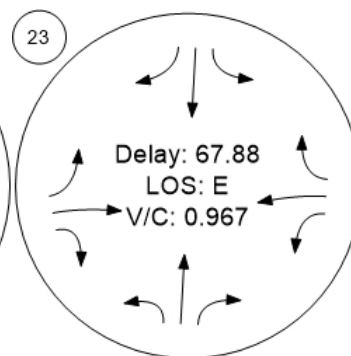
MD 410/Editors Park Dr



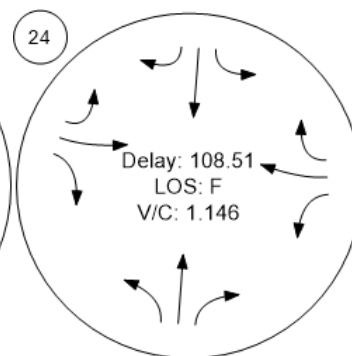
MD 410/Prince George's Plaz



MD 410/Belcrest Rd

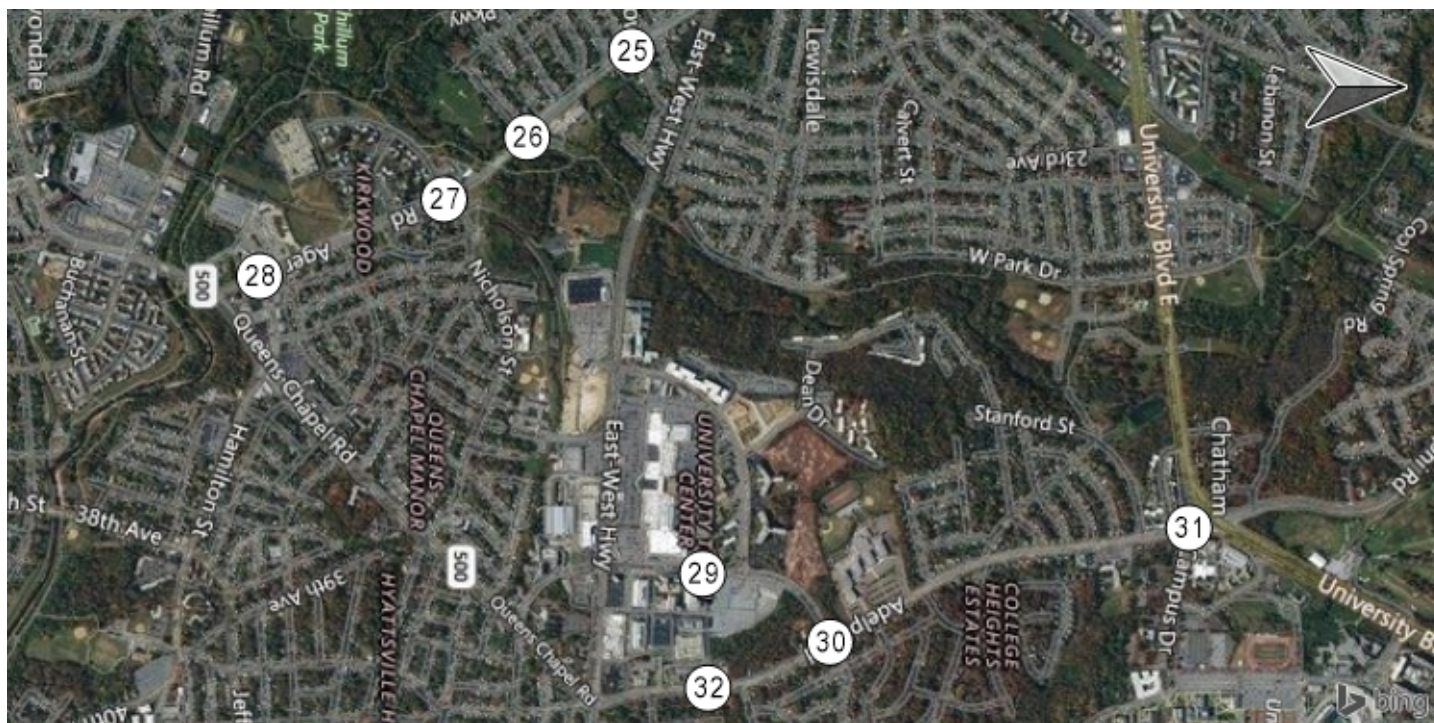


MD 410/MD 500/Adelphi Rd

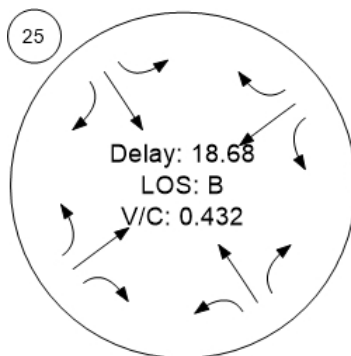




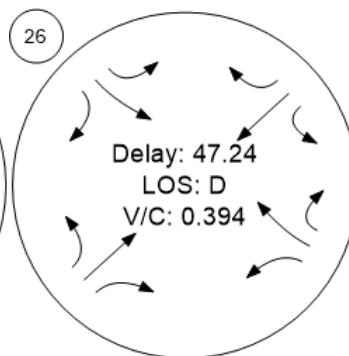
## Traffic Conditions



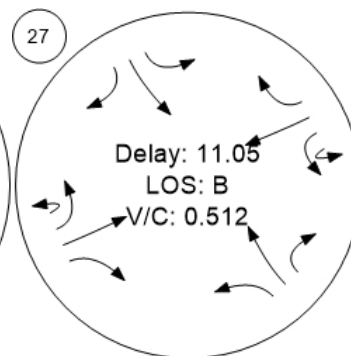
Ager Rd/23rd Ave



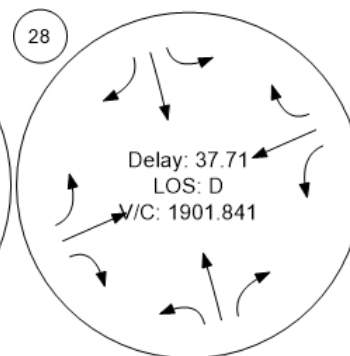
Ager Rd/Oglethorpe St/Scho



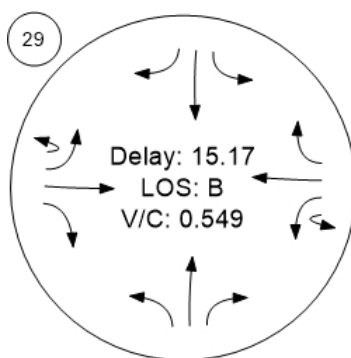
Ager Rd/Nicholson St



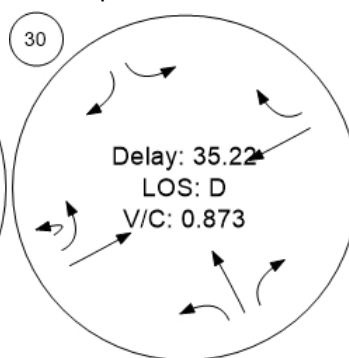
Ager Rd/Hamilton St



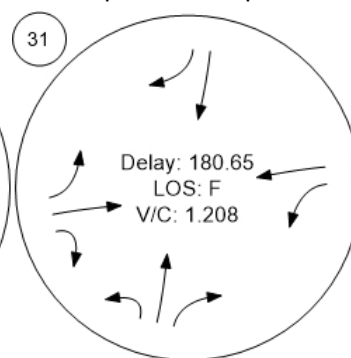
Toledo Rd/Belcrest Rd



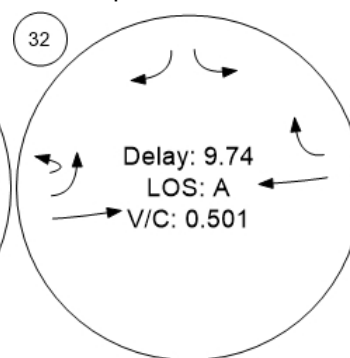
Adelphi Rd/Belcrest Rd



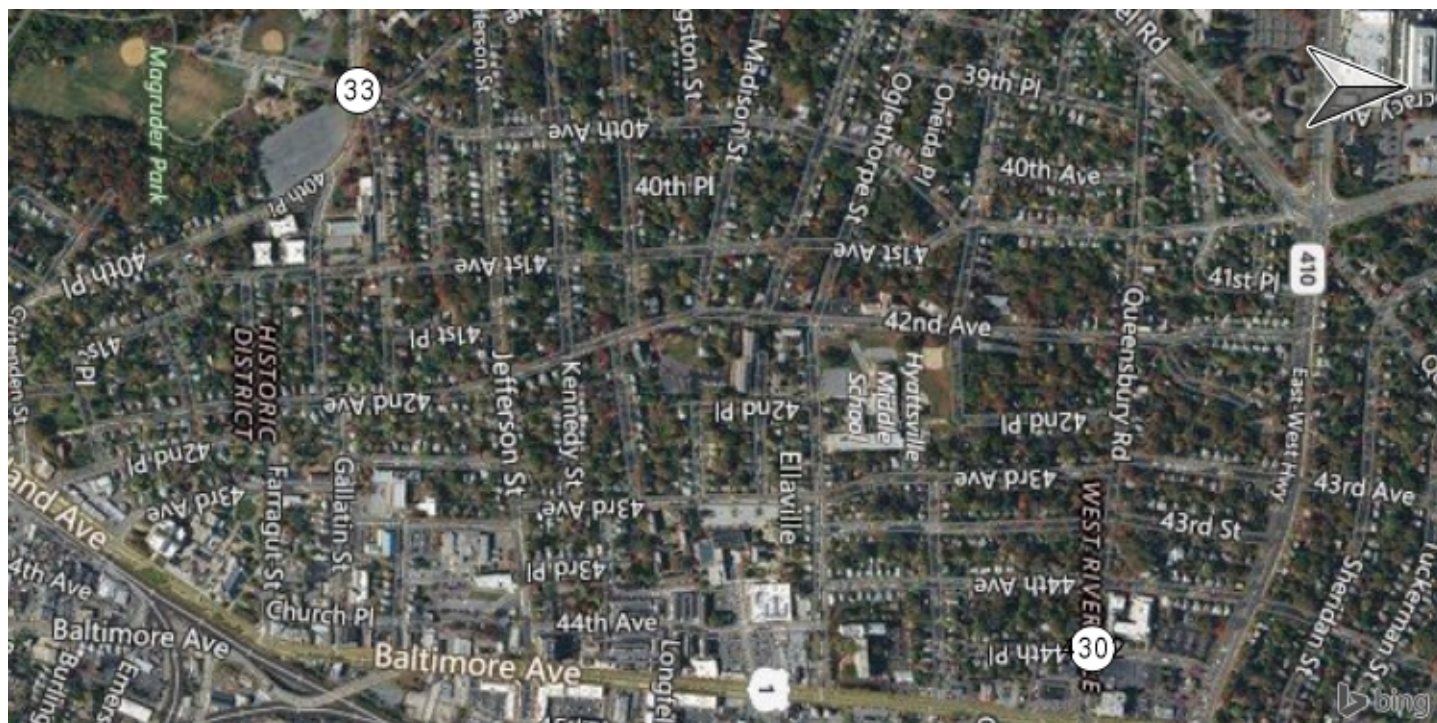
Adelphi Rd/Campus Dr



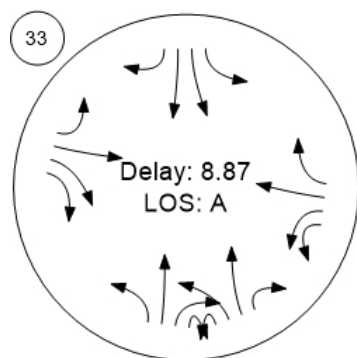
Adelphi Rd/Toledo Rd



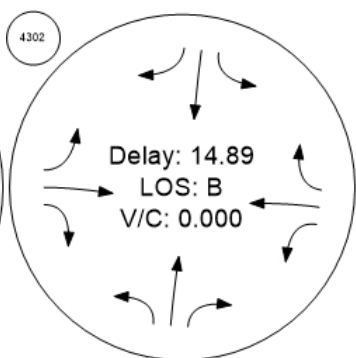
## Traffic Conditions



Hamilton St/40th Pl/39th Ave



New Intersection





Hyattsville Transportation Plan

Vistro File: K:\...\2037 PM No Build.vistro  
Report File: K:\...\2037 PM\_No Build.pdf

Scenario: Base Scenario  
6/21/2018

**Intersection Analysis Summary**

| ID | Intersection Name                     | Control Type | Method          | Worst Mvmt | V/C    | Delay (s/veh) | LOS |
|----|---------------------------------------|--------------|-----------------|------------|--------|---------------|-----|
| 1  | MD 500/Ager Rd                        | Signalized   | HCM 2010        | NEB Thru   | 0.984  | 37.4          | D   |
| 2  | MD 500/Hamilton St                    | Signalized   | HCM 2010        | NWB Right  | 0.839  | 47.3          | D   |
| 3  | MD 500/Nicholson St                   | Signalized   | HCM 2010        | SEB Left   | 0.631  | 13.7          | B   |
| 4  | MD 500/Belcrest Rd/Queensbury Rd      | Signalized   | HCM 2010        | EB Left    | 0.758  | 35.4          | D   |
| 5  | MD 208(Hamilton St)/38th Ave          | Signalized   | HCM 2010        | SEB Left   | 0.957  | 48.4          | D   |
| 6  | US 1/MD 410                           | Signalized   | HCM 2010        | EB Left    | 1.117  | 144.0         | F   |
| 7  | US 1/Queensbury Rd                    | Signalized   | HCM 2010        | SB Left    | 0.861  | 28.9          | C   |
| 8  | US 1/Oglethorpe Rd                    | Signalized   | HCM 2010        | EB Left    | 0.505  | 6.6           | A   |
| 9  | US 1/Madison St                       | Signalized   | HCM 2010        | EB Right   | 0.475  | 10.7          | B   |
| 10 | US 1/Jefferson St                     | Signalized   | HCM 2010        | EB Right   | 0.595  | 18.4          | B   |
| 11 | US 1/Hamilton St (North)              | Signalized   | HCM 2010        | WB Right   | 0.463  | 2.1           | A   |
| 12 | US 1/Hamilton St (South)/US 1 Alt     | Signalized   | HCM 2010        | NWB Right  | 1.285  | 100.4         | F   |
| 13 | US 1 Alt/Decatur St                   | Signalized   | HCM 2010        | WB Right   | 0.720  | 19.6          | B   |
| 14 | US 1 Alt/Charles Armentrout St        | Two-way stop | HCM 2010        | EB Left    | 70.395 | 10,000.0      | F   |
| 15 | US 1/Gallatin St                      | Signalized   | HCM 2010        | NB Thru    | 0.271  | 1.4           | A   |
| 16 | US 1/Farragut St                      | Signalized   | HCM 2010        | EB Left    | 0.538  | 10.1          | B   |
| 17 | US 1/43rd Ave                         | Two-way stop | HCM 6th Edition | SEB Left   | 0.099  | 21.6          | C   |
| 18 | US 1/42nd Place/Crittendon Street     | Signalized   | HCM 2010        | EB Right   | 0.892  | 53.2          | D   |
| 19 | US 1/41st Place/Charles Armentrout Dr | Signalized   | HCM 2010        | NWB Left   | 0.904  | 33.0          | C   |
| 20 | MD 410/Toledo Terrace                 | Signalized   | HCM 2010        | NB Left    | 8.025  | 115.5         | F   |
| 21 | MD 410/Editors Park Dr                | Two-way stop | HCM 2010        | NB Left    | 8.839  | 4,351.3       | F   |
| 22 | MD 410/Prince George's Plaza          | Signalized   | HCM 2010        | NB Right   | 0.535  | 24.6          | C   |
| 23 | MD 410/Belcrest Rd                    | Signalized   | HCM 2010        | WB Left    | 1.021  | 120.3         | F   |
| 24 | MD 410/MD 500/Adelphi Rd              | Signalized   | HCM 2010        | NEB Right  | 1.199  | 212.1         | F   |
| 25 | Ager Rd/23rd Ave                      | Signalized   | HCM 6th Edition | NEB Thru   | 0.432  | 18.7          | B   |
|    | Ager Rd/Oglethorpe                    |              | HCM 6th         |            |        |               |     |

Version 6.00-00

|    |                              |              |                  |           |       |          |   |
|----|------------------------------|--------------|------------------|-----------|-------|----------|---|
| 26 | Ager Rd/Greenhope St/School  | Signalized   | HCM 2010 Edition | SEB Right | 0.394 | 47.2     | D |
| 27 | Ager Rd/Nicholson St         | Two-way stop | HCM 2010         | SWB Thru  | 0.721 | 10,000.0 | F |
| 28 | Ager Rd/Hamilton St          | Signalized   | HCM 2010         | WB Right  | 0.821 | 25.5     | C |
| 29 | Toledo Rd/Belcrest Rd        | Signalized   | HCM 2010         | EB Left   | 0.549 | 15.2     | B |
| 30 | Adelphi Rd/Belcrest Rd       | Signalized   | HCM 2010         | SWB Left  | 0.873 | 35.2     | D |
| 31 | Adelphi Rd/Campus Dr         | Signalized   | HCM 2010         | WB Left   | 1.208 | 180.6    | F |
| 32 | Adelphi Rd/Toledo Rd         | Signalized   | HCM 2010         | EB Left   | 0.501 | 9.7      | A |
| 33 | Hamilton St/40th Pl/39th Ave | All-way stop | HCM 2010         | EB Thru   | 0.771 | 21.3     | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.



### Intersection Level Of Service Report

#### Intersection 1: MD 500/Ager Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 37.4  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.984

#### Intersection Setup

| Name                   | Ager Rd.                                                                          |        | MD 500                                                                             |        | MD 500                                                                              |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Southbound                                                                        |        | Northeastbound                                                                     |        | Southwestbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Right  | Left                                                                               | Thru   | Thru                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1                                                                                  | 0      | 0                                                                                   | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 400.00                                                                             | 100.00 | 100.00                                                                              | 300.00 |
| Speed [mph]            | 35.00                                                                             |        | 40.00                                                                              |        | 40.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | No                                                                                  |        |

#### Volumes

| Name                                    | Ager Rd. |        | MD 500 |        | MD 500 |        |
|-----------------------------------------|----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 0        | 364    | 633    | 1298   | 1027   | 58     |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00     | 2.00   | 2.00   | 2.00   | 2.00   | 3.85   |
| Growth Rate                             | 1.00     | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0        | 37     | 61     | 81     | 44     | 0      |
| Diverted Trips [veh/h]                  | 0        | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0        | 401    | 694    | 1379   | 1071   | 58     |
| Peak Hour Factor                        | 1.0000   | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0        | 109    | 189    | 375    | 291    | 16     |
| Total Analysis Volume [veh/h]           | 0        | 436    | 754    | 1499   | 1164   | 63     |
| Presence of On-Street Parking           | No       | No     | No     | No     | No     | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 9        |        | 0      |        | 0      |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0      |        | 0      |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 22.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Protected | Permissive | Split | Split |
|------------------------------|------------|------------|-----------|------------|-------|-------|
| Signal group                 | 0          | 4          | 4         | 2          | 2     | 0     |
| Auxiliary Signal Groups      |            |            |           |            |       |       |
| Lead / Lag                   | -          | -          | Lag       | -          | -     | -     |
| Minimum Green [s]            | 0          | 5          | 5         | 20         | 20    | 0     |
| Maximum Green [s]            | 0          | 43         | 43        | 36         | 36    | 0     |
| Amber [s]                    | 0.0        | 4.0        | 4.0       | 5.0        | 5.0   | 0.0   |
| All red [s]                  | 0.0        | 1.0        | 1.0       | 1.0        | 1.0   | 0.0   |
| Split [s]                    | 0          | 48         | 48        | 42         | 42    | 0     |
| Vehicle Extension [s]        | 0.0        | 3.0        | 3.0       | 3.0        | 3.0   | 0.0   |
| Walk [s]                     | 0          | 5          | 5         | 0          | 0     | 0     |
| Pedestrian Clearance [s]     | 0          | 10         | 10        | 0          | 0     | 0     |
| Rest In Walk                 |            | No         |           | No         | No    |       |
| I1, Start-Up Lost Time [s]   | 0.0        | 2.0        | 2.0       | 2.0        | 2.0   | 0.0   |
| I2, Clearance Lost Time [s]  | 0.0        | 3.0        | 3.0       | 4.0        | 4.0   | 0.0   |
| Minimum Recall               |            | No         | No        | No         | No    |       |
| Maximum Recall               |            | No         | No        | Yes        | Yes   |       |
| Pedestrian Recall            |            | No         | No        | No         | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0       | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 0.0        | 30.0       | 30.0      | 30.0       | 30.0  | 0.0   |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00      | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | R     | L     | C     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 87    | 87    | 87    | 87    | 87    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 4.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 40    | 40    | 36    | 36    | 36    |
| g / C, Green / Cycle                    | 0.46  | 0.46  | 0.42  | 0.42  | 0.42  |
| (v / s)_i Volume / Saturation Flow Rate | 0.28  | 0.43  | 0.42  | 0.33  | 0.04  |
| s, saturation flow rate [veh/h]         | 1583  | 1774  | 3547  | 3547  | 1545  |
| c, Capacity [veh/h]                     | 724   | 811   | 1475  | 1475  | 642   |
| d1, Uniform Delay [s]                   | 17.60 | 22.19 | 25.29 | 22.00 | 15.41 |
| k, delay calibration                    | 0.12  | 0.34  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.92  | 13.97 | 27.64 | 4.37  | 0.30  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |       |
|---------------------------------------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.60   | 0.93   | 1.02   | 0.79   | 0.10  |
| d, Delay for Lane Group [s/veh]       | 18.52  | 36.15  | 52.94  | 26.37  | 15.71 |
| Lane Group LOS                        | B      | D      | F      | C      | B     |
| Critical Lane Group                   | No     | Yes    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 6.17   | 15.89  | 19.16  | 10.16  | 0.76  |
| 50th-Percentile Queue Length [ft/ln]  | 154.20 | 397.25 | 479.09 | 254.10 | 18.92 |
| 95th-Percentile Queue Length [veh/ln] | 10.24  | 22.43  | 26.66  | 15.39  | 1.36  |
| 95th-Percentile Queue Length [ft/ln]  | 256.03 | 560.69 | 666.46 | 384.81 | 34.06 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 0.00  | 18.52 | 36.15 | 52.94 | 26.37 | 15.71 |
| Movement LOS                    |       | B     | D     | F     | C     | B     |
| d_A, Approach Delay [s/veh]     | 18.52 |       | 47.32 |       | 25.82 |       |
| Approach LOS                    | B     |       | D     |       | C     |       |
| d_I, Intersection Delay [s/veh] | 37.38 |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |
| Intersection V/C                | 0.984 |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 42s

SG: 4 48s

SG: 104 15s

### Intersection Level Of Service Report

#### Intersection 2: MD 500/Hamilton St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 47.3  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.839

#### Intersection Setup

| Name                   | MD 500                                                                            |       |       |       | MD 500                                                                            |        |        | Hamilton St                                                                         |        |        | Hamilton St                                                                         |        |       |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|-------|
| Approach               | Northeastbound                                                                    |       |       |       | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |       |
| Lane Configuration     |  |       |       |       |  |        |        |  |        |        |  |        |       |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00 |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 1     | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1     |
| Pocket Length [ft]     | 200.0                                                                             | 100.0 | 100.0 | 200.0 | 220.00                                                                            | 100.00 | 200.00 | 200.00                                                                              | 100.00 | 100.00 | 180.00                                                                              | 100.00 | 50.00 |
| Speed [mph]            | 40.00                                                                             |       |       |       | 40.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |       |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |       |
| Crosswalk              | Yes                                                                               |       |       |       | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |       |

#### Volumes

| Name                                    | MD 500 |       |       |       | MD 500 |        |        | Hamilton St |        |        | Hamilton St |        |        |
|-----------------------------------------|--------|-------|-------|-------|--------|--------|--------|-------------|--------|--------|-------------|--------|--------|
| Base Volume Input [veh/h]               | 2      | 149   | 1342  | 316   | 166    | 784    | 143    | 199         | 459    | 89     | 168         | 462    | 38     |
| Base Volume Adjustment Factor           | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 0.00  | 2.00  | 2.63  | 2.00   | 2.00   | 2.63   | 2.27        | 2.11   | 2.00   | 2.00        | 2.27   | 3.85   |
| Growth Rate                             | 1.00   | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0     | 81    | 0     | 11     | 44     | 48     | 0           | 36     | 20     | 29          | 22     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Total Hourly Volume [veh/h]             | 2      | 149   | 1423  | 316   | 177    | 828    | 191    | 199         | 495    | 109    | 197         | 484    | 38     |
| Peak Hour Factor                        | 0.920  | 0.920 | 0.920 | 0.920 | 0.9200 | 0.9200 | 0.9200 | 0.9200      | 0.9200 | 0.9200 | 0.9200      | 0.9200 | 0.9200 |
| Other Adjustment Factor                 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1      | 40    | 387   | 86    | 48     | 225    | 52     | 54          | 135    | 30     | 54          | 132    | 10     |
| Total Analysis Volume [veh/h]           | 2      | 162   | 1547  | 343   | 192    | 900    | 208    | 216         | 538    | 118    | 214         | 526    | 41     |
| Presence of On-Street Parking           | No     |       |       | No    | No     |        | No     | No          |        | No     | No          |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0     | 0     | 0     | 0      | 0      | 0      | 0           | 0      | 0      | 0           | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |       |       |       | 0      |        |        | 0           |        |        | 0           |        |        |
| Bicycle Volume [bicycles/h]             | 0      |       |       |       | 0      |        |        | 0           |        |        | 0           |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 180                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 23.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 16.00                           |

**Phasing & Timing**

| Control Type                 | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 1     | 1     | 6     | 6     | 5        | 2       | 2       | 3        | 8       | 8       | 7        | 4       | 4       |
| Auxiliary Signal Groups      |       |       |       |       |          |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lead  | Lead  | -     | -     | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 20    | 20    | 5        | 5       | 5       | 5        | 5       | 5       | 5        | 5       | 5       |
| Maximum Green [s]            | 29    | 29    | 30    | 30    | 30       | 30      | 30      | 25       | 75      | 75      | 25       | 75      | 75      |
| Amber [s]                    | 4.0   | 4.0   | 5.0   | 5.0   | 3.0      | 5.0     | 5.0     | 4.0      | 4.0     | 4.0     | 4.0      | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 1.0   | 1.0      | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     |
| Split [s]                    | 34    | 34    | 36    | 36    | 34       | 36      | 36      | 30       | 80      | 80      | 30       | 80      | 80      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 5.0   | 5.0   | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       |       | No    |       |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 4.0   | 4.0   | 2.0      | 4.0     | 4.0     | 3.0      | 3.0     | 3.0     | 3.0      | 3.0     | 3.0     |
| Minimum Recall               |       | No    | No    |       | No       | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    | Yes   |       | No       | Yes     |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |       | No    | No    |       | No       | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 5.0   | 5.0   | 5.0      | 5.0     | 5.0     | 30.0     | 30.0    | 30.0    | 30.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | C     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   | 180   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 4.00  | 4.00  | 0.00  | 4.00  | 4.00  | 0.00  | 3.00  | 3.00  | 0.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 108   | 92    | 92    | 108   | 94    | 94    | 61    | 37    | 37    | 61    | 37    | 37    |
| g / C, Green / Cycle                    | 0.60  | 0.51  | 0.51  | 0.60  | 0.52  | 0.52  | 0.34  | 0.21  | 0.21  | 0.34  | 0.20  | 0.20  |
| (v / s)_i Volume / Saturation Flow Rate | 0.21  | 0.44  | 0.22  | 0.36  | 0.25  | 0.13  | 0.18  | 0.18  | 0.18  | 0.19  | 0.15  | 0.03  |
| s, saturation flow rate [veh/h]         | 766   | 3547  | 1574  | 531   | 3547  | 1574  | 1196  | 1861  | 1746  | 1132  | 3537  | 1555  |
| c, Capacity [veh/h]                     | 418   | 1803  | 800   | 252   | 1848  | 820   | 342   | 382   | 358   | 305   | 721   | 317   |
| d1, Uniform Delay [s]                   | 18.94 | 38.60 | 27.83 | 43.39 | 27.66 | 23.79 | 47.39 | 69.51 | 69.52 | 48.71 | 67.02 | 58.59 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 2.75  | 5.56  | 1.68  | 19.39 | 0.92  | 0.74  | 8.61  | 7.01  | 7.45  | 2.95  | 1.44  | 0.18  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |        |        |        |        |        |        |       |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.39   | 0.86   | 0.43   | 0.76   | 0.49   | 0.25   | 0.63   | 0.89   | 0.89   | 0.70   | 0.73   | 0.13  |
| d, Delay for Lane Group [s/veh]       | 21.69  | 44.16  | 29.51  | 62.78  | 28.58  | 24.53  | 56.00  | 76.52  | 76.97  | 51.66  | 68.45  | 58.78 |
| Lane Group LOS                        | C      | D      | C      | E      | C      | C      | E      | E      | E      | D      | E      | E     |
| Critical Lane Group                   | No     | Yes    | No     | Yes    | No     | No     | No     | No     | Yes    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.31   | 30.51  | 9.68   | 4.92   | 12.66  | 5.11   | 8.21   | 15.89  | 14.97  | 7.56   | 11.48  | 1.56  |
| 50th-Percentile Queue Length [ft/ln]  | 82.64  | 762.75 | 242.05 | 123.05 | 316.56 | 127.71 | 205.25 | 397.28 | 374.23 | 189.06 | 287.04 | 39.04 |
| 95th-Percentile Queue Length [veh/ln] | 5.95   | 39.57  | 14.79  | 8.56   | 18.50  | 8.82   | 12.91  | 22.43  | 21.31  | 12.07  | 17.04  | 2.81  |
| 95th-Percentile Queue Length [ft/ln]  | 148.75 | 989.21 | 369.63 | 214.01 | 462.45 | 220.38 | 322.73 | 560.73 | 532.86 | 301.81 | 425.96 | 70.26 |

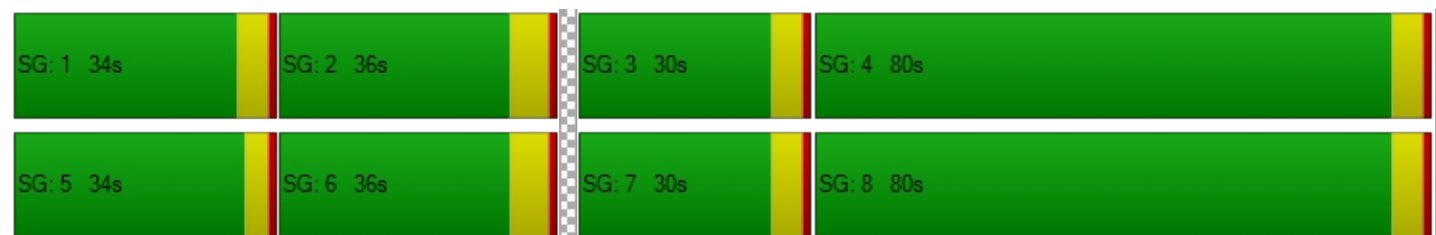


**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 21.69 | 21.69 | 44.16 | 29.51 | 62.78 | 28.58 | 24.53 | 56.00 | 76.69 | 76.97 | 51.66 | 68.45 | 58.78 |
| Movement LOS                    | C     | C     | D     | C     | E     | C     | C     | E     | E     | E     | D     | E     | E     |
| d_A, Approach Delay [s/veh]     | 39.92 |       |       |       | 32.99 |       |       | 71.60 |       |       | 63.34 |       |       |
| Approach LOS                    | D     |       |       |       | C     |       |       | E     |       |       | E     |       |       |
| d_I, Intersection Delay [s/veh] | 47.29 |       |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.839 |       |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: MD 500/Nicholson St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 13.7  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.631

#### Intersection Setup

| Name                   | Nicholson St                                                                      |        |        | MD 500                                                                            |        |        | MD 500                                                                              |       |       |       | Nicholson St                                                                        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Westbound                                                                         |        |        | Northeastbound                                                                    |        |        | Southwestbound                                                                      |       |       |       | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |       |       |       |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0     | 0     | 0     | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 150.00                                                                            | 100.00 | 100.00 | 150.0                                                                               | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |       |       |       | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |       |       |       | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |       |       |       | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Nicholson St |        |        | MD 500 |        |        | MD 500 |       |       |       | Nicholson St |        |        |
|-----------------------------------------|--------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 9            | 11     | 11     | 42     | 1548   | 41     | 1      | 35    | 1100  | 98    | 96           | 17     | 35     |
| Base Volume Adjustment Factor           | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00         | 0.00   | 0.00   | 0.00   | 2.00   | 0.00   | 0.00   | 0.00  | 2.00  | 0.00  | 2.27         | 0.00   | 0.00   |
| Growth Rate                             | 1.00         | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00         | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0            | 0      | 0      | 0      | 130    | 0      | 0      | 0     | 103   | 0     | 0            | 0      | 0      |
| Diverted Trips [veh/h]                  | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 9            | 11     | 11     | 42     | 1678   | 41     | 1      | 35    | 1203  | 98    | 96           | 17     | 35     |
| Peak Hour Factor                        | 0.9000       | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.900  | 0.900 | 0.900 | 0.900 | 0.9000       | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.000  | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3            | 3      | 3      | 12     | 466    | 11     | 0      | 10    | 334   | 27    | 27           | 5      | 10     |
| Total Analysis Volume [veh/h]           | 10           | 12     | 12     | 47     | 1864   | 46     | 1      | 39    | 1337  | 109   | 107          | 19     | 39     |
| Presence of On-Street Parking           | No           |        | No     | No     |        | No     | No     |       |       | No    | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0            | 0      | 0      | 0      | 0      | 0      | 0      | 0     | 0     | 0     | 0            | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0            |        |        | 0      |        |        | 0      |       |       |       | 0            |        |        |
| Bicycle Volume [bicycles/h]             | 0            |        |        | 0      |        |        | 0      |       |       |       | 0            |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permi | Prote | Permi | Permi | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|----------|---------|---------|-------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 5        | 2       | 0       | 0     | 1     | 6     | 0     | 0       | 8       | 0       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |       |       |       |       |         |         |         |
| Lead / Lag                   | -       | -       | -       | Lead     | -       | -       | -     | Lead  | -     | -     | -       | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 5        | 5       | 0       | 0     | 5     | 5     | 0     | 0       | 5       | 0       |
| Maximum Green [s]            | 0       | 30      | 0       | 30       | 30      | 0       | 0     | 30    | 30    | 0     | 0       | 30      | 0       |
| Amber [s]                    | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 0.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     | 0.0   | 1.0   | 1.0   | 0.0   | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 0       | 25      | 0       | 10       | 85      | 0       | 0     | 10    | 85    | 0     | 0       | 25      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 0.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0       | 5       | 0       | 0        | 5       | 0       | 0     | 0     | 5     | 0     | 0       | 5       | 0       |
| Pedestrian Clearance [s]     | 0       | 10      | 0       | 0        | 10      | 0       | 0     | 0     | 10    | 0     | 0       | 10      | 0       |
| Rest In Walk                 |         | No      |         |          | No      |         |       |       | No    |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 0.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 0.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 0.0     |
| Minimum Recall               |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Maximum Recall               |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Pedestrian Recall            |         | No      |         | No       | No      |         |       | No    | No    |       |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L    | C    | C    | L    | C    | C    | C     |
|-----------------------------------------|-------|------|------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 48    | 48   | 48   | 48   | 48   | 48   | 48   | 48    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00  |
| g_i, Effective Green Time [s]           | 6     | 34   | 27   | 27   | 34   | 27   | 27   | 6     |
| g / C, Green / Cycle                    | 0.13  | 0.70 | 0.57 | 0.57 | 0.70 | 0.57 | 0.57 | 0.13  |
| (v / s)_i Volume / Saturation Flow Rate | 0.02  | 0.08 | 0.51 | 0.52 | 0.09 | 0.39 | 0.39 | 0.10  |
| s, saturation flow rate [veh/h]         | 1772  | 560  | 1863 | 1847 | 430  | 1863 | 1814 | 1572  |
| c, Capacity [veh/h]                     | 331   | 514  | 1069 | 1060 | 418  | 1059 | 1031 | 331   |
| d1, Uniform Delay [s]                   | 18.41 | 4.36 | 8.92 | 9.00 | 8.22 | 7.33 | 7.37 | 20.08 |
| k, delay calibration                    | 0.11  | 0.11 | 0.32 | 0.32 | 0.11 | 0.18 | 0.18 | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 0.13  | 0.08 | 7.71 | 8.38 | 0.10 | 1.32 | 1.41 | 1.16  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |      |        |        |      |        |        |       |
|---------------------------------------|-------|------|--------|--------|------|--------|--------|-------|
| X, volume / capacity                  | 0.10  | 0.09 | 0.89   | 0.90   | 0.10 | 0.69   | 0.69   | 0.50  |
| d, Delay for Lane Group [s/veh]       | 18.55 | 4.43 | 16.63  | 17.38  | 8.32 | 8.65   | 8.78   | 21.24 |
| Lane Group LOS                        | B     | A    | B      | B      | A    | A      | A      | C     |
| Critical Lane Group                   | No    | No   | No     | Yes    | Yes  | No     | No     | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 0.31  | 0.06 | 7.74   | 7.97   | 0.06 | 3.81   | 3.78   | 1.69  |
| 50th-Percentile Queue Length [ft/ln]  | 7.80  | 1.59 | 193.50 | 199.18 | 1.40 | 95.32  | 94.50  | 42.35 |
| 95th-Percentile Queue Length [veh/ln] | 0.56  | 0.11 | 12.30  | 12.60  | 0.10 | 6.86   | 6.80   | 3.05  |
| 95th-Percentile Queue Length [ft/ln]  | 14.04 | 2.86 | 307.56 | 314.90 | 2.53 | 171.58 | 170.11 | 76.24 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |      |      |      |      |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 18.55 | 18.55 | 18.55 | 4.43  | 16.99 | 17.38 | 8.32 | 8.32 | 8.71 | 8.78 | 21.24 | 21.24 | 21.24 |
| Movement LOS                    | B     | B     | B     | A     | B     | B     | A    | A    | A    | A    | C     | C     | C     |
| d_A, Approach Delay [s/veh]     | 18.55 |       |       | 16.70 |       |       | 8.70 |      |      |      | 21.24 |       |       |
| Approach LOS                    | B     |       |       | B     |       |       | A    |      |      |      | C     |       |       |
| d_I, Intersection Delay [s/veh] | 13.66 |       |       |       |       |       |      |      |      |      |       |       |       |
| Intersection LOS                | B     |       |       |       |       |       |      |      |      |      |       |       |       |
| Intersection V/C                | 0.631 |       |       |       |       |       |      |      |      |      |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 4: MD 500/Belcrest Rd/Queensbury Rd

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 35.4  |
| Analysis Method: | HCM 2010   | Level Of Service:         | D     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.758 |

#### Intersection Setup

| Name                   |                                                                                   |        |        | Queensbury Road                                                                   |        |        | MD 500                                                                              |        |        | MD 500                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Eastbound                                                                         |        |        | Westbound                                                                         |        |        | Northeastbound                                                                      |        |        | Southwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 375.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Queensbury Road |        |        | MD 500 |        |        | MD 500 |        |        |
|-----------------------------------------|--------|--------|--------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 85     | 211    | 614    | 66              | 203    | 37     | 472    | 1120   | 87     | 30     | 658    | 36     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85   | 2.38   | 2.21   | 3.85            | 2.38   | 3.85   | 2.21   | 2.08   | 2.78   | 3.70   | 1.97   | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00            | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 55     | 0               | 0      | 0      | 71     | 59     | 0      | 0      | 48     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 85     | 211    | 669    | 66              | 203    | 37     | 543    | 1179   | 87     | 30     | 706    | 36     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000          | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 24     | 59     | 186    | 18              | 56     | 10     | 151    | 328    | 24     | 8      | 196    | 10     |
| Total Analysis Volume [veh/h]           | 94     | 234    | 743    | 73              | 226    | 41     | 603    | 1310   | 97     | 33     | 784    | 40     |
| Presence of On-Street Parking           | No     |        | No     | No              |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 6      |        |        | 18              |        |        | 1      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0               |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 63.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Unsigna | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 4       | 3       | 0       | 8       | 4       | 8       | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lag     | -       | -       | -       | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 8       | 8       | 0       | 0       | 8       | 0       | 8        | 25      | 25      | 8        | 25      | 25      |
| Maximum Green [s]            | 30      | 30      | 0       | 0       | 30      | 0       | 40       | 53      | 53      | 40       | 53      | 53      |
| Amber [s]                    | 4.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 4.0      | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     |
| All red [s]                  | 3.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| Split [s]                    | 82      | 82      | 0       | 0       | 82      | 0       | 14       | 38      | 38      | 30       | 54      | 54      |
| Vehicle Extension [s]        | 4.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 5.0      | 6.0     | 6.0     | 3.5      | 6.0     | 6.0     |
| Walk [s]                     | 7       | 7       | 0       | 0       | 7       | 0       | 0        | 7       | 7       | 0        | 7       | 7       |
| Pedestrian Clearance [s]     | 24      | 24      | 0       | 0       | 24      | 0       | 0        | 24      | 24      | 0        | 24      | 24      |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 5.0     | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0    | 30.0    | 0.0     | 0.0     | 30.0    | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | L      | C     | C     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 105    | 105   | 105   | 105   | 105   | 105   | 105   | 105   | 105   |
| L, Total Lost Time per Cycle [s]        | 7.00   | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00   | 0.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.00   | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 30     | 30    | 30    | 61    | 50    | 50    | 61    | 39    | 39    |
| g / C, Green / Cycle                    | 0.28   | 0.28  | 0.28  | 0.58  | 0.48  | 0.48  | 0.58  | 0.37  | 0.37  |
| (v / s)_i Volume / Saturation Flow Rate | 0.09   | 0.13  | 0.27  | 0.30  | 0.38  | 0.39  | 0.06  | 0.22  | 0.22  |
| s, saturation flow rate [veh/h]         | 1088   | 1856  | 1240  | 1990  | 1861  | 1812  | 576   | 1863  | 1831  |
| c, Capacity [veh/h]                     | 70     | 527   | 394   | 1065  | 890   | 866   | 313   | 694   | 682   |
| d1, Uniform Delay [s]                   | 52.74  | 30.92 | 38.75 | 14.29 | 23.07 | 23.47 | 15.75 | 26.71 | 26.71 |
| k, delay calibration                    | 0.15   | 0.15  | 0.38  | 0.23  | 0.43  | 0.44  | 0.39  | 0.39  | 0.39  |
| l, Upstream Filtering Factor            | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 184.84 | 0.84  | 17.15 | 1.02  | 6.19  | 7.23  | 0.53  | 2.99  | 3.04  |
| d3, Initial Queue Delay [s]             | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

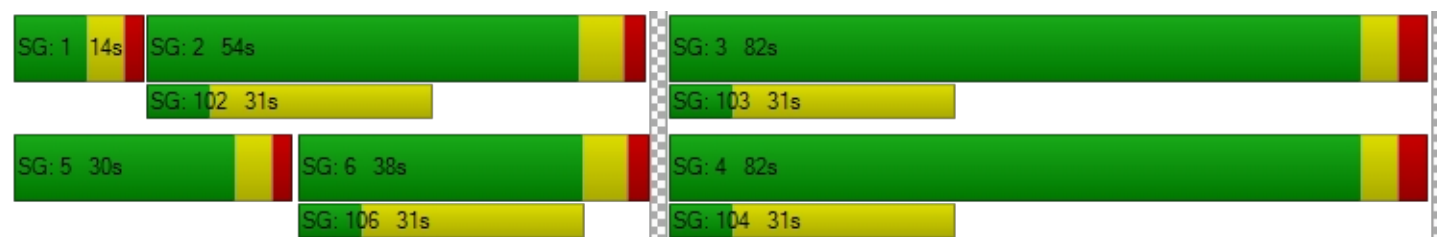
|                                       |        |        |        |        |        |        |       |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 1.35   | 0.44   | 0.86   | 0.57   | 0.79   | 0.81   | 0.11  | 0.60   | 0.60   |
| d, Delay for Lane Group [s/veh]       | 237.57 | 31.75  | 55.90  | 15.31  | 29.27  | 30.69  | 16.28 | 29.69  | 29.76  |
| Lane Group LOS                        | F      | C      | E      | B      | C      | C      | B     | C      | C      |
| Critical Lane Group                   | No     | No     | Yes    | No     | No     | Yes    | Yes   | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 5.40   | 4.96   | 10.49  | 3.56   | 15.55  | 15.99  | 0.34  | 8.50   | 8.37   |
| 50th-Percentile Queue Length [ft/ln]  | 135.08 | 123.98 | 262.14 | 89.08  | 388.64 | 399.77 | 8.44  | 212.41 | 209.16 |
| 95th-Percentile Queue Length [veh/ln] | 9.73   | 8.61   | 15.80  | 6.41   | 22.01  | 22.55  | 0.61  | 13.28  | 13.11  |
| 95th-Percentile Queue Length [ft/ln]  | 243.15 | 215.28 | 394.91 | 160.35 | 550.30 | 563.73 | 15.18 | 331.92 | 327.75 |

**Movement, Approach, & Intersection Results**

|                                 |        |       |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|--------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 237.57 | 31.75 | 0.00 | 55.90 | 55.90 | 55.90 | 15.31 | 29.93 | 30.69 | 16.28 | 29.72 | 29.76 |
| Movement LOS                    | F      | C     |      | E     | E     | E     | B     | C     | C     | B     | C     | C     |
| d_A, Approach Delay [s/veh]     | 90.74  |       |      | 55.90 |       |       | 25.58 |       |       | 29.21 |       |       |
| Approach LOS                    | F      |       |      | E     |       |       | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 35.42  |       |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D      |       |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.758  |       |      |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 5: MD 208(Hamilton St)/38th Ave

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 48.4  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.957

#### Intersection Setup

| Name                   |                                                                                   |        |        | Hamilton St                                                                       |        |        | 38th Ave                                                                            |        |        | Hamilton St                                                                         |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Westbound                                                                         |        |        | Southwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 125.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 35.00                                                                             |        |        | 30.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Hamilton St |        |        | 38th Ave |        |        | Hamilton St |        |        |
|-----------------------------------------|--------|--------|--------|-------------|--------|--------|----------|--------|--------|-------------|--------|--------|
| Base Volume Input [veh/h]               | 244    | 185    | 32     | 23          | 424    | 35     | 63       | 125    | 185    | 197         | 369    | 162    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.27   | 3.33   | 0.00   | 3.70        | 2.00   | 0.00   | 0.00     | 2.22   | 1.89   | 1.69        | 1.88   | 1.65   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Site-Generated Trips [veh/h]            | 44     | 0      | 0      | 0           | 12     | 0      | 0        | 0      | 0      | 0           | 7      | 26     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Total Hourly Volume [veh/h]             | 288    | 185    | 32     | 23          | 436    | 35     | 63       | 125    | 185    | 197         | 376    | 188    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 80     | 51     | 9      | 6           | 121    | 10     | 18       | 35     | 51     | 55          | 104    | 52     |
| Total Analysis Volume [veh/h]           | 320    | 206    | 36     | 26          | 484    | 39     | 70       | 139    | 206    | 219         | 418    | 209    |
| Presence of On-Street Parking           | No     |        | No     | No          |        | No     | No       |        | No     | No          |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0           | 0      | 0      |
| Pedestrian Volume [ped/h]               | 5      |        |        | 4           |        |        | 5        |        |        | 6           |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0           |        |        | 0        |        |        | 0           |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 90                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Semi-actuated                |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 2       | 8       | 8       | 8       | 6       | 6       | 6       | 4       | 4       | 4       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 20      | 20      | 20      | 15      | 15      | 15      | 20      | 20      | 20      |
| Maximum Green [s]            | 15       | 45      | 45      | 35      | 35      | 35      | 20      | 20      | 20      | 35      | 35      | 35      |
| Amber [s]                    | 4.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0      | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 25       | 50      | 50      | 40      | 40      | 40      | 25      | 25      | 25      | 40      | 40      | 40      |
| Vehicle Extension [s]        | 3.0      | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               | Yes      | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | Yes      | Yes     |         |         | Yes     |         |         | Yes     |         |         | Yes     |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0     | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L     | C     | C     | L      | C     |
|-----------------------------------------|-------|-------|-------|-------|--------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90    | 90     | 90    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00   | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 2.00  | 0.00  | 2.00  | 2.00   | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 3.00  | 3.00  | 3.00  | 3.00   | 3.00  |
| g_i, Effective Green Time [s]           | 45    | 35    | 35    | 25    | 35     | 35    |
| g / C, Green / Cycle                    | 0.50  | 0.39  | 0.39  | 0.28  | 0.39   | 0.39  |
| (v / s)_i Volume / Saturation Flow Rate | 0.49  | 0.03  | 0.28  | 0.25  | 0.25   | 0.36  |
| s, saturation flow rate [veh/h]         | 1150  | 782   | 1838  | 1658  | 877    | 1757  |
| c, Capacity [veh/h]                     | 677   | 104   | 715   | 504   | 189    | 683   |
| d1, Uniform Delay [s]                   | 17.38 | 43.77 | 23.49 | 31.38 | 41.79  | 26.13 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50   | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  |
| d2, Incremental Delay [s]               | 11.30 | 5.73  | 6.52  | 14.07 | 115.27 | 19.28 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  |

**Lane Group Results**

|                                       |        |       |        |        |        |        |
|---------------------------------------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.83   | 0.25  | 0.73   | 0.82   | 1.16   | 0.92   |
| d, Delay for Lane Group [s/veh]       | 28.67  | 49.50 | 30.02  | 45.45  | 157.05 | 45.41  |
| Lane Group LOS                        | C      | D     | C      | D      | F      | D      |
| Critical Lane Group                   | Yes    | No    | No     | Yes    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 10.05  | 0.73  | 10.19  | 10.37  | 10.18  | 15.52  |
| 50th-Percentile Queue Length [ft/ln]  | 251.17 | 18.33 | 254.75 | 259.33 | 254.40 | 388.04 |
| 95th-Percentile Queue Length [veh/ln] | 15.25  | 1.32  | 15.43  | 15.66  | 16.79  | 21.98  |
| 95th-Percentile Queue Length [ft/ln]  | 381.13 | 32.99 | 385.63 | 391.39 | 419.68 | 549.57 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |        |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 28.67 | 28.67 | 28.67 | 49.50 | 30.02 | 30.02 | 45.45 | 45.45 | 45.45 | 157.05 | 45.41 | 45.41 |
| Movement LOS                    | C     | C     | C     | D     | C     | C     | D     | D     | D     | F      | D     | D     |
| d_A, Approach Delay [s/veh]     | 28.67 |       |       | 30.94 |       |       | 45.45 |       |       | 74.31  |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | D     |       |       | E      |       |       |
| d_I, Intersection Delay [s/veh] | 48.41 |       |       |       |       |       |       |       |       |        |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |        |       |       |
| Intersection V/C                | 0.957 |       |       |       |       |       |       |       |       |        |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 6: US 1/MD 410

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 144.0  
 Level Of Service: F  
 Volume to Capacity (v/c): 1.117

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 2                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 200.00                                                                            | 100.00 | 100.00 | 225.00                                                                            | 100.00 | 100.00 | 600.00                                                                              | 100.00 | 100.00 | 700.00                                                                              | 100.00 | 450.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 45.00                                                                             |        |        | 50.00                                                                               |        |        | 40.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 450    | 549    | 64     | 232    | 606    | 199    | 336    | 1602   | 380    | 245    | 1383   | 158    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.15   | 2.00   | 2.38   | 2.07   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.03   | 1.67   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 28     | 0      | 0      | 0      | 0      | 28     | 15     | 33     | 15     | 0      | 56     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 478    | 549    | 64     | 232    | 606    | 227    | 351    | 1635   | 395    | 245    | 1439   | 158    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 133    | 153    | 18     | 64     | 168    | 63     | 98     | 454    | 110    | 68     | 400    | 44     |
| Total Analysis Volume [veh/h]           | 531    | 610    | 71     | 258    | 673    | 252    | 390    | 1817   | 439    | 272    | 1599   | 176    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 3      |        |        | 6      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0      |        |        | 0      |        |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 180                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 9.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 1        | 6       | 6       | 5        | 2       | 0       | 7        | 4       | 4       | 3        | 8       | 8       |
| Auxiliary Signal Groups      |          |         |         |          |         |         |          |         |         |          |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 5        | 25      | 0       | 5        | 15      | 15      | 5        | 25      | 25      |
| Maximum Green [s]            | 29       | 38      | 38      | 29       | 38      | 0       | 24       | 66      | 66      | 24       | 66      | 66      |
| Amber [s]                    | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 0.0     | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 0.0     | 1.0      | 2.0     | 2.0     | 1.0      | 2.0     | 2.0     |
| Split [s]                    | 34       | 45      | 45      | 34       | 45      | 0       | 29       | 72      | 72      | 29       | 72      | 72      |
| Vehicle Extension [s]        | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 0.0     | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Walk [s]                     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 4.5     | 4.5     | 3.0      | 4.5     | 0.0     | 3.0      | 4.5     | 4.5     | 3.0      | 4.5     | 4.5     |
| Minimum Recall               | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               | No       | Yes     |         | No       | Yes     |         | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            | No       | No      |         | No       | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 294.0   | 294.0   |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 30.0     | 5.0     | 5.0     | 30.0     | 6.0     | 6.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | L      | C      | R     | L      | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|--------|--------|-------|--------|-------|-------|
| C, Cycle Length [s]                     | 180   | 180   | 180   | 180   | 180   | 180   | 180    | 180    | 180   | 180    | 180   | 180   |
| L, Total Lost Time per Cycle [s]        | 6.50  | 6.50  | 6.50  | 6.50  | 6.50  | 6.50  | 5.00   | 6.50   | 6.50  | 5.00   | 6.50  | 6.50  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00   | 0.00  | 0.00   | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 4.50  | 4.50  | 0.00  | 4.50  | 4.50  | 3.00   | 4.50   | 4.50  | 3.00   | 4.50  | 4.50  |
| g_i, Effective Green Time [s]           | 72    | 46    | 46    | 72    | 43    | 43    | 24     | 66     | 66    | 24     | 66    | 66    |
| g / C, Green / Cycle                    | 0.40  | 0.26  | 0.26  | 0.40  | 0.24  | 0.24  | 0.13   | 0.36   | 0.36  | 0.13   | 0.36  | 0.36  |
| (v / s)_i Volume / Saturation Flow Rate | 0.26  | 0.19  | 0.19  | 0.23  | 0.26  | 0.26  | 0.22   | 0.51   | 0.28  | 0.15   | 0.33  | 0.34  |
| s, saturation flow rate [veh/h]         | 2035  | 1863  | 1792  | 1098  | 1863  | 1688  | 1774   | 3547   | 1583  | 1774   | 3546  | 1770  |
| c, Capacity [veh/h]                     | 621   | 477   | 459   | 371   | 443   | 402   | 237    | 1291   | 576   | 237    | 1290  | 644   |
| d1, Uniform Delay [s]                   | 52.87 | 61.17 | 61.22 | 41.69 | 68.59 | 68.59 | 78.00  | 57.25  | 50.38 | 78.00  | 54.59 | 54.82 |
| k, delay calibration                    | 0.29  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50   | 0.50   | 0.50  | 0.50   | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00  | 1.00   | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 8.82  | 9.29  | 9.75  | 10.35 | 69.74 | 74.22 | 310.15 | 188.17 | 9.20  | 104.97 | 11.55 | 20.83 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00   | 0.00  | 0.00   | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00  | 1.00   | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00  | 1.00   | 1.00  | 1.00  |

**Lane Group Results**

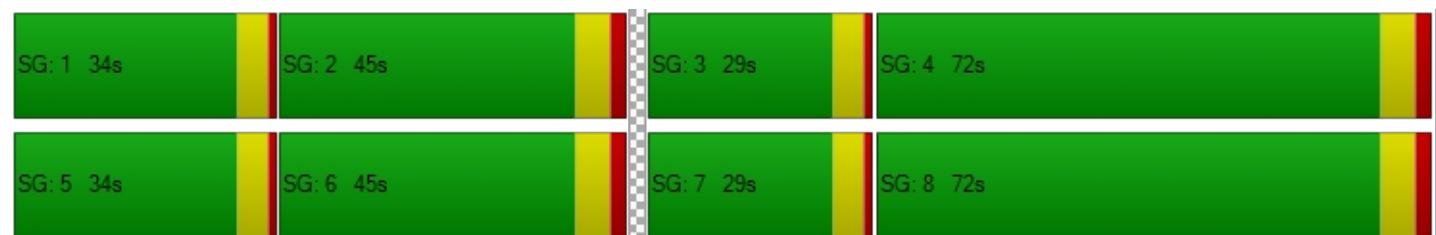
|                                       |        |        |        |        |        |        |         |         |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.86   | 0.73   | 0.73   | 0.70   | 1.09   | 1.10   | 1.65    | 1.41    | 0.76   | 1.15   | 0.92   | 0.92   |
| d, Delay for Lane Group [s/veh]       | 61.69  | 70.46  | 70.98  | 52.04  | 138.32 | 142.81 | 388.15  | 245.41  | 59.58  | 182.97 | 66.14  | 75.65  |
| Lane Group LOS                        | E      | E      | E      | D      | F      | F      | F       | F       | E      | F      | E      | E      |
| Critical Lane Group                   | Yes    | No     | No     | No     | No     | Yes    | No      | Yes     | No     | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 9.02   | 15.53  | 15.07  | 9.01   | 28.68  | 26.50  | 31.17   | 62.15   | 18.49  | 17.81  | 27.27  | 29.19  |
| 50th-Percentile Queue Length [ft/ln]  | 225.42 | 388.30 | 376.76 | 225.13 | 717.08 | 662.45 | 779.26  | 1553.85 | 462.19 | 445.33 | 681.72 | 729.74 |
| 95th-Percentile Queue Length [veh/ln] | 13.94  | 22.00  | 21.44  | 13.93  | 39.48  | 36.93  | 48.20   | 91.86   | 25.54  | 26.34  | 35.83  | 38.05  |
| 95th-Percentile Queue Length [ft/ln]  | 348.53 | 549.88 | 535.93 | 348.17 | 987.02 | 923.35 | 1204.98 | 2296.39 | 638.48 | 658.47 | 895.82 | 951.25 |

**Movement, Approach, & Intersection Results**

|                                 |        |       |       |        |        |        |        |        |       |        |       |       |
|---------------------------------|--------|-------|-------|--------|--------|--------|--------|--------|-------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 61.69  | 70.68 | 70.98 | 52.04  | 139.58 | 142.81 | 388.15 | 245.41 | 59.58 | 182.97 | 68.63 | 75.65 |
| Movement LOS                    | E      | E     | E     | D      | F      | F      | F      | F      | E     | F      | E     | E     |
| d_A, Approach Delay [s/veh]     | 66.76  |       |       | 121.18 |        |        | 235.62 |        |       | 84.42  |       |       |
| Approach LOS                    | E      |       |       | F      |        |        | F      |        |       | F      |       |       |
| d_I, Intersection Delay [s/veh] | 143.98 |       |       |        |        |        |        |        |       |        |       |       |
| Intersection LOS                | F      |       |       |        |        |        |        |        |       |        |       |       |
| Intersection V/C                | 1.117  |       |       |        |        |        |        |        |       |        |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 7: US 1/Queensbury Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 28.9  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.861

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Queensbury                                                                          |        |        | Queensbury                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 250.00                                                                            | 100.00 | 100.00 | 150.00                                                                            | 100.00 | 100.00 | 350.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 200.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 45.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | No                                                                                |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Queensbury |        |        | Queensbury |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 77     | 892    | 155    | 205    | 900    | 114    | 50         | 276    | 85     | 44         | 148    | 140    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 1.89   | 3.85   | 2.00   | 3.85   | 1.96       | 2.30   | 1.85   | 1.69       | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 28     | 0      | 0      | 15     | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 77     | 920    | 155    | 205    | 915    | 114    | 50         | 276    | 85     | 44         | 148    | 140    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 21     | 256    | 43     | 57     | 254    | 32     | 14         | 77     | 24     | 12         | 41     | 39     |
| Total Analysis Volume [veh/h]           | 86     | 1022   | 172    | 228    | 1017   | 127    | 56         | 307    | 94     | 49         | 164    | 156    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No         |        | No     | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 11     |        |        | 11         |        |        | 4          |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0          |        |        | 0          |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 2       | 6       | 6       | 6       | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 5        | 15      | 15      | 15      | 15      | 15      | 8       | 8       | 8       | 8       | 8       | 8       |
| Maximum Green [s]            | 9        | 50      | 50      | 36      | 36      | 36      | 29      | 29      | 29      | 29      | 29      | 29      |
| Amber [s]                    | 3.5      | 4.5     | 4.5     | 4.5     | 4.5     | 4.5     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0      | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 14       | 56      | 56      | 42      | 42      | 42      | 34      | 34      | 34      | 34      | 34      | 34      |
| Vehicle Extension [s]        | 3.0      | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 2.5      | 3.5     | 3.5     | 3.5     | 3.5     | 3.5     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | No       | Yes     |         |         | Yes     |         |         | No      |         |         | No      |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 294.0   | 294.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0     | 6.0     | 6.0     | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L      | C     | C     | L     | C     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90     | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.50  | 5.50  | 5.50  | 5.50   | 5.50  | 5.50  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 2.00   | 0.00  | 0.00  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 3.50  | 3.50  | 3.50   | 3.50  | 3.50  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 52    | 52    | 52    | 43     | 43    | 43    | 27    | 27    | 27    | 27    | 27    |
| g / C, Green / Cycle                    | 0.58  | 0.58  | 0.58  | 0.48   | 0.48  | 0.48  | 0.30  | 0.30  | 0.30  | 0.30  | 0.30  |
| (v / s)_i Volume / Saturation Flow Rate | 0.13  | 0.33  | 0.33  | 0.50   | 0.31  | 0.32  | 0.05  | 0.22  | 0.05  | 0.09  | 0.10  |
| s, saturation flow rate [veh/h]         | 661   | 1863  | 1769  | 458    | 1863  | 1786  | 1209  | 1784  | 983   | 1863  | 1566  |
| c, Capacity [veh/h]                     | 388   | 1080  | 1025  | 199    | 895   | 858   | 332   | 541   | 151   | 565   | 475   |
| d1, Uniform Delay [s]                   | 11.32 | 11.82 | 11.85 | 38.05  | 17.66 | 17.74 | 29.54 | 28.16 | 40.73 | 23.94 | 24.24 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50   | 0.50  | 0.50  | 0.11  | 0.21  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.31  | 2.14  | 2.29  | 109.48 | 3.65  | 3.90  | 0.24  | 3.89  | 1.22  | 0.28  | 0.40  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |        |        |       |        |       |        |        |
|---------------------------------------|-------|--------|--------|--------|--------|--------|-------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.22  | 0.57   | 0.57   | 1.15   | 0.65   | 0.66   | 0.17  | 0.74   | 0.32  | 0.29   | 0.33   |
| d, Delay for Lane Group [s/veh]       | 12.63 | 13.96  | 14.14  | 147.53 | 21.31  | 21.64  | 29.77 | 32.05  | 41.95 | 24.22  | 24.64  |
| Lane Group LOS                        | B     | B      | B      | F      | C      | C      | C     | C      | D     | C      | C      |
| Critical Lane Group                   | Yes   | No     | No     | Yes    | No     | No     | No    | Yes    | No    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 0.77  | 6.96   | 6.71   | 10.29  | 8.88   | 8.68   | 1.01  | 8.09   | 1.10  | 2.65   | 2.57   |
| 50th-Percentile Queue Length [ft/ln]  | 19.26 | 174.05 | 167.65 | 257.37 | 222.03 | 217.04 | 25.32 | 202.32 | 27.44 | 66.34  | 64.17  |
| 95th-Percentile Queue Length [veh/ln] | 1.39  | 11.29  | 10.95  | 16.96  | 13.77  | 13.51  | 1.82  | 12.76  | 1.98  | 4.78   | 4.62   |
| 95th-Percentile Queue Length [ft/ln]  | 34.66 | 282.24 | 273.82 | 423.94 | 344.22 | 337.85 | 45.58 | 318.95 | 49.39 | 119.42 | 115.51 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |        |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 12.63 | 14.04 | 14.14 | 147.53 | 21.45 | 21.64 | 29.77 | 32.05 | 32.05 | 41.95 | 24.22 | 24.64 |
| Movement LOS                    | B     | B     | B     | F      | C     | C     | C     | C     | C     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 13.96 |       |       | 42.42  |       |       | 31.78 |       |       | 26.75 |       |       |
| Approach LOS                    | B     |       |       | D      |       |       | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 28.88 |       |       |        |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |        |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.861 |       |       |        |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |





### Intersection Level Of Service Report

#### Intersection 8: US 1/Oglethorpe Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 6.6  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.505

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Oglethorpe                                                                          |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 35.00                                                                             |        | 40.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | No                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Oglethorpe |        |
|-----------------------------------------|--------|--------|--------|--------|------------|--------|
| Base Volume Input [veh/h]               | 43     | 1153   | 1049   | 9      | 54         | 28     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.04   | 1.97   | 0.00   | 1.67       | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00       | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0          | 0      |
| Site-Generated Trips [veh/h]            | 0      | 28     | 15     | 0      | 0          | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0          | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0          | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0          | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0          | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0          | 0      |
| Total Hourly Volume [veh/h]             | 43     | 1181   | 1064   | 9      | 54         | 28     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000     | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000     | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 12     | 328    | 296    | 3      | 15         | 8      |
| Total Analysis Volume [veh/h]           | 48     | 1312   | 1182   | 10     | 60         | 31     |
| Presence of On-Street Parking           | No     | No     | No     | No     | No         | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0          | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0          | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0          |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0          |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 105.0                           |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 2          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |       |       |
| Lead / Lag                   | Lag        | -          | -          | -          | Lag   | -     |
| Minimum Green [s]            | 15         | 15         | 15         | 15         | 15    | 15    |
| Maximum Green [s]            | 85         | 85         | 85         | 85         | 25    | 25    |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 90         | 90         | 90         | 90         | 30    | 30    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 0          | 0          | 0          | 0          | 0     | 0     |
| Pedestrian Clearance [s]     | 0          | 0          | 0          | 0          | 0     | 0     |
| Rest In Walk                 |            | No         | No         |            | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Minimum Recall               |            | No         | No         |            | No    |       |
| Maximum Recall               |            | Yes        | Yes        |            | No    |       |
| Pedestrian Recall            |            | No         | No         |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C    | C    | C     |
|-----------------------------------------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00 | 3.00 | 3.00 | 3.00 | 3.00  |
| g_i, Effective Green Time [s]           | 96   | 96   | 96   | 96   | 14    |
| g / C, Green / Cycle                    | 0.80 | 0.80 | 0.80 | 0.80 | 0.12  |
| (v / s)_i Volume / Saturation Flow Rate | 0.42 | 0.41 | 0.32 | 0.32 | 0.05  |
| s, saturation flow rate [veh/h]         | 1615 | 1694 | 1863 | 1858 | 1738  |
| c, Capacity [veh/h]                     | 1318 | 1349 | 1484 | 1479 | 209   |
| d1, Uniform Delay [s]                   | 3.89 | 4.20 | 3.66 | 3.67 | 48.99 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 1.40 | 1.39 | 0.81 | 0.82 | 1.42  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.51   | 0.51   | 0.40   | 0.40   | 0.43   |
| d, Delay for Lane Group [s/veh]       | 5.30   | 5.58   | 4.47   | 4.48   | 50.41  |
| Lane Group LOS                        | A      | A      | A      | A      | D      |
| Critical Lane Group                   | Yes    | No     | No     | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 4.34   | 4.77   | 3.34   | 3.35   | 2.65   |
| 50th-Percentile Queue Length [ft/ln]  | 108.61 | 119.28 | 83.50  | 83.64  | 66.13  |
| 95th-Percentile Queue Length [veh/ln] | 7.76   | 8.35   | 6.01   | 6.02   | 4.76   |
| 95th-Percentile Queue Length [ft/ln]  | 194.07 | 208.83 | 150.29 | 150.55 | 119.04 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |       |       |
|---------------------------------|-------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 5.30  | 5.45 | 4.48 | 4.48 | 50.41 | 50.41 |
| Movement LOS                    | A     | A    | A    | A    | D     | D     |
| d_A, Approach Delay [s/veh]     | 5.44  |      | 4.48 |      | 50.41 |       |
| Approach LOS                    | A     |      | A    |      | D     |       |
| d_I, Intersection Delay [s/veh] | 6.56  |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |       |       |
| Intersection V/C                | 0.505 |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 90s

SG: 4 30s

SG: 6 90s

### Intersection Level Of Service Report

#### Intersection 9: US 1/Madison St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 10.7  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.475

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Madison                                                                             |        |        | Madison                                                                             |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Madison |        |        | Madison |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|---------|--------|--------|---------|--------|--------|
| Base Volume Input [veh/h]               | 15     | 1162   | 85     | 19     | 1029   | 27     | 19      | 16     | 26     | 16      | 5      | 21     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.00   | 0.00   | 0.00   | 2.00   | 0.00   | 0.00    | 0.00   | 0.00   | 0.00    | 0.00   | 1.61   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00    | 1.00   | 1.00   | 1.00    | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 28     | 0      | 0      | 15     | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Total Hourly Volume [veh/h]             | 15     | 1190   | 85     | 19     | 1044   | 27     | 19      | 16     | 26     | 16      | 5      | 21     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000  | 0.9000 | 0.9000 | 0.9000  | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 | 1.0000  | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4      | 331    | 24     | 5      | 290    | 8      | 5       | 4      | 7      | 4       | 1      | 6      |
| Total Analysis Volume [veh/h]           | 17     | 1322   | 94     | 21     | 1160   | 30     | 21      | 18     | 29     | 18      | 6      | 23     |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No      |        | No     | No      |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0      | 0      | 0       | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 2       |        |        | 0       |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0       |        |        | 0       |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 105.0                           |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 2       | 2       | 2       | 6       | 6       | 6       | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 20      | 20      | 20      | 20      | 15      | 15      | 15      | 15      | 15      | 15      |
| Maximum Green [s]            | 85      | 85      | 85      | 85      | 85      | 85      | 25      | 25      | 25      | 25      | 25      | 25      |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 90      | 90      | 90      | 90      | 90      | 90      | 30      | 30      | 30      | 30      | 30      | 30      |
| Vehicle Extension [s]        | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               |         | Yes     |         |         | Yes     |         |         | Yes     |         |         | Yes     |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | C    | L     | C    | C    | C     | C     |
|-----------------------------------------|-------|------|------|-------|------|------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120  | 120  | 120   | 120  | 120  | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00 | 5.00 | 5.00  | 5.00 | 5.00 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 2.00  | 0.00 | 0.00 | 2.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00 | 3.00 | 3.00  | 3.00 | 3.00 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 85    | 85   | 85   | 85    | 85   | 85   | 25    | 25    |
| g / C, Green / Cycle                    | 0.71  | 0.71 | 0.71 | 0.71  | 0.71 | 0.71 | 0.21  | 0.21  |
| (v / s)_i Volume / Saturation Flow Rate | 0.04  | 0.38 | 0.39 | 0.05  | 0.32 | 0.32 | 0.04  | 0.03  |
| s, saturation flow rate [veh/h]         | 478   | 1863 | 1820 | 385   | 1863 | 1846 | 1633  | 1595  |
| c, Capacity [veh/h]                     | 325   | 1319 | 1289 | 257   | 1319 | 1308 | 380   | 374   |
| d1, Uniform Delay [s]                   | 12.32 | 8.28 | 8.31 | 15.13 | 7.51 | 7.52 | 39.11 | 38.64 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50 | 0.50 | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.31  | 1.60 | 1.65 | 0.62  | 1.12 | 1.14 | 1.03  | 0.69  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |        |       |       |
|---------------------------------------|-------|--------|--------|-------|--------|--------|-------|-------|
| X, volume / capacity                  | 0.05  | 0.54   | 0.54   | 0.08  | 0.45   | 0.45   | 0.18  | 0.13  |
| d, Delay for Lane Group [s/veh]       | 12.63 | 9.88   | 9.96   | 15.75 | 8.64   | 8.65   | 40.14 | 39.33 |
| Lane Group LOS                        | B     | A      | A      | B     | A      | A      | D     | D     |
| Critical Lane Group                   | No    | No     | Yes    | No    | No     | No     | Yes   | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.23  | 8.25   | 8.14   | 0.34  | 6.23   | 6.18   | 1.79  | 1.22  |
| 50th-Percentile Queue Length [ft/ln]  | 5.86  | 206.21 | 203.52 | 8.42  | 155.69 | 154.53 | 44.68 | 30.45 |
| 95th-Percentile Queue Length [veh/ln] | 0.42  | 12.96  | 12.82  | 0.61  | 10.32  | 10.26  | 3.22  | 2.19  |
| 95th-Percentile Queue Length [ft/ln]  | 10.54 | 323.96 | 320.51 | 15.15 | 258.01 | 256.47 | 80.42 | 54.81 |



**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 12.63 | 9.92 | 9.96 | 15.75 | 8.64 | 8.65 | 40.14 | 40.14 | 40.14 | 39.33 | 39.33 | 39.33 |
| Movement LOS                    | B     | A    | A    | B     | A    | A    | D     | D     | D     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 9.95  |      |      | 8.77  |      |      | 40.14 |       |       | 39.33 |       |       |
| Approach LOS                    | A     |      |      | A     |      |      | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 10.68 |      |      |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.475 |      |      |       |      |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 90s

SG: 4 30s

SG: 6 90s

SG: 8 30s

### Intersection Level Of Service Report

#### Intersection 10: US 1/Jefferson St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 18.4  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.595

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Jefferson St                                                                        |        |        | Jefferson St                                                                        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00 | 175.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | No                                                                                |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Jefferson St |        |        | Jefferson St |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 171    | 1136   | 32     | 63     | 958    | 63     | 76           | 49     | 130    | 59           | 52     | 34     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.82   | 2.00   | 2.00   | 2.00   | 2.00   | 2.22   | 1.43         | 2.00   | 1.82   | 2.00         | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 28     | 0      | 0      | 15     | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 171    | 1164   | 32     | 63     | 973    | 63     | 76           | 49     | 130    | 59           | 52     | 34     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 0.9000       | 1.0000 | 0.9000 | 1.0000       | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 48     | 323    | 8      | 16     | 270    | 18     | 21           | 12     | 36     | 15           | 13     | 9      |
| Total Analysis Volume [veh/h]           | 190    | 1293   | 32     | 63     | 1081   | 70     | 84           | 49     | 144    | 59           | 52     | 34     |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 108.0                           |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 5        | 2       | 0       | 0       | 6       | 6       | 4       | 4       | 4       | 0       | 4       | 0       |
| Auxiliary Signal Groups      |          |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | Lead     | -       | -       | -       | -       | -       | Lag     | -       | -       | -       | -       | -       |
| Minimum Green [s]            | 8        | 20      | 0       | 0       | 20      | 20      | 20      | 20      | 20      | 0       | 20      | 0       |
| Maximum Green [s]            | 15       | 85      | 0       | 0       | 65      | 65      | 25      | 25      | 25      | 0       | 25      | 0       |
| Amber [s]                    | 4.0      | 4.0     | 0.0     | 0.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                  | 1.0      | 1.0     | 0.0     | 0.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 20       | 90      | 0       | 0       | 70      | 70      | 30      | 30      | 30      | 0       | 30      | 0       |
| Vehicle Extension [s]        | 3.0      | 3.0     | 0.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |          | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 3.0      | 3.0     | 0.0     | 0.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 0.0     | 3.0     | 0.0     |
| Minimum Recall               | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               | No       | Yes     |         |         | Yes     |         |         | No      |         |         | No      |         |
| Pedestrian Recall            | No       | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | L     | C     | C     | C     | C     |
|-----------------------------------------|------|------|------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120   | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 0.00 | 3.00 | 3.00 | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 85   | 85   | 85   | 72    | 72    | 72    | 25    | 25    |
| g / C, Green / Cycle                    | 0.71 | 0.71 | 0.71 | 0.60  | 0.60  | 0.60  | 0.21  | 0.21  |
| (v / s)_i Volume / Saturation Flow Rate | 0.29 | 0.36 | 0.36 | 0.15  | 0.31  | 0.31  | 0.19  | 0.13  |
| s, saturation flow rate [veh/h]         | 655  | 1863 | 1847 | 412   | 1863  | 1823  | 1436  | 1074  |
| c, Capacity [veh/h]                     | 465  | 1322 | 1311 | 234   | 1119  | 1095  | 336   | 265   |
| d1, Uniform Delay [s]                   | 9.02 | 7.86 | 7.87 | 23.70 | 13.91 | 13.92 | 46.84 | 42.46 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  | 0.36  | 0.17  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 2.65 | 1.37 | 1.39 | 2.82  | 1.73  | 1.77  | 15.28 | 2.76  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |        |        |        |
|---------------------------------------|-------|--------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.41  | 0.50   | 0.50   | 0.27  | 0.52   | 0.52   | 0.82   | 0.55   |
| d, Delay for Lane Group [s/veh]       | 11.68 | 9.23   | 9.26   | 26.52 | 15.64  | 15.69  | 62.12  | 45.22  |
| Lane Group LOS                        | B     | A      | A      | C     | B      | B      | E      | D      |
| Critical Lane Group                   | No    | No     | Yes    | No    | No     | No     | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 1.74  | 7.29   | 7.27   | 1.39  | 9.15   | 8.99   | 9.61   | 4.10   |
| 50th-Percentile Queue Length [ft/ln]  | 43.54 | 182.35 | 181.66 | 34.64 | 228.84 | 224.70 | 240.20 | 102.43 |
| 95th-Percentile Queue Length [veh/ln] | 3.13  | 11.72  | 11.69  | 2.49  | 14.12  | 13.90  | 14.69  | 7.38   |
| 95th-Percentile Queue Length [ft/ln]  | 78.37 | 293.08 | 292.19 | 62.34 | 352.89 | 347.62 | 367.28 | 184.38 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 11.68 | 9.24 | 9.26 | 26.52 | 15.66 | 15.69 | 62.12 | 62.12 | 62.12 | 45.22 | 45.22 | 45.22 |
| Movement LOS                    | B     | A    | A    | C     | B     | B     | E     | E     | E     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 9.55  |      |      | 16.23 |       |       | 62.12 |       |       | 45.22 |       |       |
| Approach LOS                    | A     |      |      | B     |       |       | E     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 18.38 |      |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.595 |      |      |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 11: US 1/Hamilton St (North)

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 2.1   |
| Analysis Method: | HCM 2010   | Level Of Service:         | A     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.463 |

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Hamilton                                                                            |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Westbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Thru   | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 1                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 150.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 35.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Hamilton |        |
|-----------------------------------------|--------|--------|--------|--------|----------|--------|
| Base Volume Input [veh/h]               | 1394   | 0      | 3      | 999    | 0        | 5      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 3.85   | 0.00   | 2.04   | 0.00     | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 28     | 0      | 0      | 15     | 0        | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0        | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 1422   | 0      | 3      | 1014   | 0        | 5      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 395    | 0      | 1      | 282    | 0        | 1      |
| Total Analysis Volume [veh/h]           | 1580   | 0      | 3      | 1127   | 0        | 6      |
| Presence of On-Street Parking           | No     | No     | No     | No     | No       | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0        | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0        | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0        |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 78.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 2          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |       |       |
| Lead / Lag                   | -          | -          | Lag        | -          | Lag   | -     |
| Minimum Green [s]            | 20         | 20         | 20         | 20         | 15    | 15    |
| Maximum Green [s]            | 89         | 89         | 89         | 89         | 20    | 20    |
| Amber [s]                    | 5.0        | 5.0        | 5.0        | 5.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 95         | 95         | 95         | 95         | 25    | 25    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 0          | 0          | 0          | 0          | 0     | 0     |
| Pedestrian Clearance [s]     | 0          | 0          | 0          | 0          | 0     | 0     |
| Rest In Walk                 | No         |            |            | No         | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 4.0        | 4.0        | 4.0        | 4.0        | 3.0   | 3.0   |
| Minimum Recall               | No         |            |            | No         | No    |       |
| Maximum Recall               | Yes        |            |            | Yes        | No    |       |
| Pedestrian Recall            | No         |            |            | No         | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |



**Lane Group Calculations**

| Lane Group                              | C    | C    | L    | C    | C     |
|-----------------------------------------|------|------|------|------|-------|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 6.00 | 6.00 | 6.00 | 6.00 | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 2.00 | 0.00 | 0.00  |
| l2, Clearance Lost Time [s]             | 4.00 | 4.00 | 4.00 | 4.00 | 3.00  |
| g_i, Effective Green Time [s]           | 106  | 106  | 106  | 106  | 3     |
| g / C, Green / Cycle                    | 0.89 | 0.89 | 0.89 | 0.89 | 0.02  |
| (v / s)_i Volume / Saturation Flow Rate | 0.42 | 0.42 | 0.01 | 0.32 | 0.00  |
| s, saturation flow rate [veh/h]         | 1863 | 1863 | 329  | 3545 | 1615  |
| c, Capacity [veh/h]                     | 1648 | 1648 | 314  | 3136 | 38    |
| d1, Uniform Delay [s]                   | 1.39 | 1.39 | 3.12 | 1.17 | 57.39 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 1.00 | 1.00 | 0.06 | 0.32 | 1.87  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |       |      |       |       |
|---------------------------------------|-------|-------|------|-------|-------|
| X, volume / capacity                  | 0.48  | 0.48  | 0.01 | 0.36  | 0.16  |
| d, Delay for Lane Group [s/veh]       | 2.39  | 2.39  | 3.17 | 1.49  | 59.26 |
| Lane Group LOS                        | A     | A     | A    | A     | E     |
| Critical Lane Group                   | Yes   | No    | No   | No    | Yes   |
| 50th-Percentile Queue Length [veh/ln] | 1.76  | 1.76  | 0.02 | 0.73  | 0.20  |
| 50th-Percentile Queue Length [ft/ln]  | 43.89 | 43.89 | 0.46 | 18.35 | 5.00  |
| 95th-Percentile Queue Length [veh/ln] | 3.16  | 3.16  | 0.03 | 1.32  | 0.36  |
| 95th-Percentile Queue Length [ft/ln]  | 79.00 | 79.00 | 0.82 | 33.03 | 9.00  |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |       |       |
|---------------------------------|-------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 2.39  | 2.39 | 3.17 | 1.49 | 59.26 | 59.26 |
| Movement LOS                    | A     | A    | A    | A    | E     | E     |
| d_A, Approach Delay [s/veh]     | 2.39  |      | 1.50 |      | 59.26 |       |
| Approach LOS                    | A     |      | A    |      | E     |       |
| d_I, Intersection Delay [s/veh] | 2.15  |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |       |       |
| Intersection V/C                | 0.463 |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 95s

SG: 4 25s

SG: 6 95s

### Intersection Level Of Service Report

#### Intersection 12: US 1/Hamilton St (South)/US 1 Alt

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 100.4 |
| Analysis Method: | HCM 2010   | Level Of Service:         | F     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.285 |

#### Intersection Setup

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Hamilton                                                                            |        |        | US 1 ALT                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Northwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 250.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

#### Volumes

| Name                                    | US 1   |        |        | US 1   |        |        | Hamilton |        |        | US 1 ALT |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]               | 0      | 658    | 81     | 634    | 459    | 0      | 5        | 30     | 7      | 47       | 0      | 717    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.17   | 0.00   | 2.00   | 2.06   | 0.00   | 0.00     | 0.00   | 0.00   | 2.63     | 0.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 12     | 0      | 8      | 7      | 0      | 0        | 0      | 0      | 0        | 0      | 16     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0      | 670    | 81     | 642    | 466    | 0      | 5        | 30     | 7      | 47       | 0      | 733    |
| Peak Hour Factor                        | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 | 0.9000   | 0.9000 | 0.9000 | 0.9000   | 1.0000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0      | 186    | 23     | 178    | 129    | 0      | 1        | 8      | 2      | 13       | 0      | 204    |
| Total Analysis Volume [veh/h]           | 0      | 744    | 90     | 713    | 518    | 0      | 6        | 33     | 8      | 52       | 0      | 814    |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0      |        |        | 3        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Semi-actuated                   |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Split | Split | Split | Permiss | Permiss | Overlap |
|------------------------------|---------|---------|---------|----------|---------|---------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 0       | 6       | 6       | 5        | 2       | 0       | 3     | 3     | 3     | 8       | 0       | 8       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |       |       |       |         |         | 5.8     |
| Lead / Lag                   | -       | -       | -       | Lead     | -       | -       | Lag   | -     | -     | Lag     | -       | -       |
| Minimum Green [s]            | 0       | 20      | 20      | 5        | 20      | 0       | 5     | 5     | 5     | 5       | 0       | 5       |
| Maximum Green [s]            | 0       | 40      | 40      | 20       | 79      | 0       | 13    | 13    | 13    | 30      | 0       | 30      |
| Amber [s]                    | 0.0     | 4.0     | 4.0     | 3.5      | 4.0     | 0.0     | 3.5   | 3.5   | 3.5   | 3.0     | 0.0     | 3.0     |
| All red [s]                  | 0.0     | 1.0     | 1.0     | 1.5      | 1.0     | 0.0     | 1.5   | 1.5   | 1.5   | 1.0     | 0.0     | 1.0     |
| Split [s]                    | 0       | 45      | 45      | 39       | 84      | 0       | 18    | 18    | 18    | 18      | 0       | 18      |
| Vehicle Extension [s]        | 0.0     | 3.0     | 3.0     | 3.0      | 3.0     | 0.0     | 3.0   | 3.0   | 3.0   | 3.0     | 0.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0        | 0       | 0       | 0     | 0     | 0     | 5       | 0       | 5       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0        | 0       | 0       | 0     | 0     | 0     | 10      | 0       | 10      |
| Rest In Walk                 |         | No      |         |          | No      |         |       | No    |       | No      |         |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 2.0     | 2.0      | 2.0     | 0.0     | 2.0   | 2.0   | 2.0   | 2.0     | 0.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 3.0     | 3.0      | 3.0     | 0.0     | 3.0   | 3.0   | 3.0   | 2.0     | 0.0     | 2.0     |
| Minimum Recall               |         | No      |         | Yes      | No      |         |       | No    |       | No      |         | No      |
| Maximum Recall               |         | Yes     |         | Yes      | Yes     |         |       | No    |       | No      |         | No      |
| Pedestrian Recall            |         | No      |         | No       | No      |         |       | No    |       | No      |         | No      |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 50.0    | 50.0    | 50.0     | 50.0    | 0.0     | 50.0  | 50.0  | 50.0  | 50.0    | 0.0     | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | C      | C     | C     | L     | R      |
|-----------------------------------------|-------|-------|--------|-------|-------|-------|--------|
| C, Cycle Length [s]                     | 120   | 120   | 120    | 120   | 120   | 120   | 120    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00   | 5.00  | 5.00  | 4.00  | 5.00   |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00   |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 0.00   | 3.00  | 3.00  | 2.00  | 0.00   |
| g_i, Effective Green Time [s]           | 40    | 40    | 79     | 79    | 4     | 23    | 61     |
| g / C, Green / Cycle                    | 0.33  | 0.33  | 0.66   | 0.66  | 0.03  | 0.19  | 0.51   |
| (v / s)_i Volume / Saturation Flow Rate | 0.22  | 0.23  | 0.88   | 0.39  | 0.03  | 0.03  | 0.65   |
| s, saturation flow rate [veh/h]         | 1860  | 1791  | 806    | 1337  | 1833  | 1763  | 1250   |
| c, Capacity [veh/h]                     | 622   | 599   | 558    | 882   | 62    | 335   | 633    |
| d1, Uniform Delay [s]                   | 34.25 | 34.63 | 21.90  | 11.35 | 57.49 | 40.56 | 29.60  |
| k, delay calibration                    | 0.50  | 0.50  | 0.50   | 0.50  | 0.11  | 0.11  | 0.50   |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00   |
| d2, Incremental Delay [s]               | 5.66  | 6.55  | 138.11 | 2.86  | 17.10 | 0.21  | 140.12 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00   |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00   |
| PF, progression factor                  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00   |

**Lane Group Results**

|                                       |        |        |         |        |       |       |         |
|---------------------------------------|--------|--------|---------|--------|-------|-------|---------|
| X, volume / capacity                  | 0.67   | 0.70   | 1.28    | 0.59   | 0.76  | 0.16  | 1.29    |
| d, Delay for Lane Group [s/veh]       | 39.91  | 41.18  | 160.01  | 14.21  | 74.59 | 40.78 | 169.72  |
| Lane Group LOS                        | D      | D      | F       | B      | E     | D     | F       |
| Critical Lane Group                   | No     | No     | Yes     | No     | Yes   | No    | Yes     |
| 50th-Percentile Queue Length [veh/ln] | 11.36  | 11.59  | 29.30   | 7.87   | 1.72  | 1.32  | 42.32   |
| 50th-Percentile Queue Length [ft/ln]  | 284.03 | 289.72 | 732.38  | 196.78 | 42.99 | 33.08 | 1058.04 |
| 95th-Percentile Queue Length [veh/ln] | 16.89  | 17.17  | 45.51   | 12.47  | 3.10  | 2.38  | 62.93   |
| 95th-Percentile Queue Length [ft/ln]  | 422.22 | 429.30 | 1137.76 | 311.81 | 77.38 | 59.54 | 1573.23 |

**Movement, Approach, & Intersection Results**

|                                 |        |       |       |        |       |      |       |       |       |        |      |        |
|---------------------------------|--------|-------|-------|--------|-------|------|-------|-------|-------|--------|------|--------|
| d_M, Delay for Movement [s/veh] | 0.00   | 40.47 | 41.18 | 160.01 | 14.21 | 0.00 | 74.59 | 74.59 | 74.59 | 40.78  | 0.00 | 169.72 |
| Movement LOS                    |        | D     | D     | F      | B     |      | E     | E     | E     | D      |      | F      |
| d_A, Approach Delay [s/veh]     | 40.54  |       |       | 98.66  |       |      | 74.59 |       |       | 161.98 |      |        |
| Approach LOS                    | D      |       |       | F      |       |      | E     |       |       | F      |      |        |
| d_I, Intersection Delay [s/veh] | 100.42 |       |       |        |       |      |       |       |       |        |      |        |
| Intersection LOS                | F      |       |       |        |       |      |       |       |       |        |      |        |
| Intersection V/C                | 1.285  |       |       |        |       |      |       |       |       |        |      |        |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 13: US 1 Alt/Decatur St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 19.6  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.720

#### Intersection Setup

| Name                   | US 1 ALT                                                                          |        | Decatur St                                                                         |        | US 1 ALT                                                                            |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Westbound                                                                          |        | Southwestbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Right  | Left                                                                                | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 1      | 0                                                                                  | 1      | 1                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | No                                                                                  |        |

#### Volumes

| Name                                    | US 1 ALT |        | Decatur St |        | US 1 ALT |        |
|-----------------------------------------|----------|--------|------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 652      | 169    | 87         | 212    | 312      | 574    |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000     | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.13     | 2.13   | 1.97       | 2.00   | 2.63     | 2.00   |
| Growth Rate                             | 1.00     | 1.00   | 1.00       | 1.00   | 1.00     | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0          | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 16       | 0      | 0          | 0      | 0        | 8      |
| Diverted Trips [veh/h]                  | 0        | 0      | 0          | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0          | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0          | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0          | 0      | 0        | 0      |
| Right-Turn on Red Volume [veh/h]        | 0        | 0      | 0          | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 668      | 169    | 87         | 212    | 312      | 582    |
| Peak Hour Factor                        | 0.9000   | 0.9000 | 0.9000     | 0.9000 | 0.9000   | 0.9000 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000     | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 186      | 47     | 24         | 59     | 87       | 162    |
| Total Analysis Volume [veh/h]           | 742      | 188    | 97         | 236    | 347      | 647    |
| Presence of On-Street Parking           | No       | No     | No         | No     | No       | No     |
| On-Street Parking Maneuver Rate [/h]    | 0        | 0      | 0          | 0      | 0        | 0      |
| Local Bus Stopping Rate [/h]            | 0        | 0      | 0          | 0      | 0        | 0      |
| Pedestrian Volume [ped/h]               | 0        |        | 0          |        | 0        |        |
| Bicycle Volume [bicycles/h]             | 0        |        | 0          |        | 0        |        |



**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 80             |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 15.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 9.00           |

**Phasing & Timing**

| Control Type                 | Permissive | Unsignalized | Split | Split | ProtectedPermissi | Permissive |
|------------------------------|------------|--------------|-------|-------|-------------------|------------|
| Signal group                 | 6          | 0            | 4     | 0     | 5                 | 2          |
| Auxiliary Signal Groups      |            |              |       |       |                   |            |
| Lead / Lag                   | -          | -            | Lag   | -     | Lead              | -          |
| Minimum Green [s]            | 10         | 0            | 5     | 0     | 4                 | 10         |
| Maximum Green [s]            | 39         | 0            | 15    | 0     | 10                | 54         |
| Amber [s]                    | 5.0        | 0.0          | 4.0   | 0.0   | 4.0               | 5.0        |
| All red [s]                  | 1.0        | 0.0          | 1.0   | 0.0   | 1.0               | 1.0        |
| Split [s]                    | 30         | 0            | 30    | 0     | 30                | 30         |
| Vehicle Extension [s]        | 0.2        | 0.0          | 3.0   | 0.0   | 3.0               | 0.2        |
| Walk [s]                     | 0          | 0            | 0     | 0     | 0                 | 0          |
| Pedestrian Clearance [s]     | 0          | 0            | 0     | 0     | 0                 | 0          |
| Rest In Walk                 | No         |              | No    |       |                   | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 0.0          | 2.0   | 0.0   | 2.0               | 2.0        |
| I2, Clearance Lost Time [s]  | 4.0        | 0.0          | 3.0   | 0.0   | 3.0               | 4.0        |
| Minimum Recall               | No         |              | No    |       | No                | No         |
| Maximum Recall               | Yes        |              | No    |       | No                | Yes        |
| Pedestrian Recall            | No         |              | No    |       | No                | No         |
| Detector Location [ft]       | 0.0        | 0.0          | 0.0   | 0.0   | 0.0               | 0.0        |
| Detector Length [ft]         | 30.0       | 0.0          | 30.0  | 0.0   | 30.0              | 30.0       |
| I, Upstream Filtering Factor | 1.00       | 1.00         | 1.00  | 1.00  | 1.00              | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | L     | R     | L     | C    |
|-----------------------------------------|-------|-------|-------|-------|------|
| C, Cycle Length [s]                     | 79    | 79    | 79    | 79    | 79   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 5.00  | 5.00  | 6.00  | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 |
| l2, Clearance Lost Time [s]             | 4.00  | 3.00  | 3.00  | 0.00  | 4.00 |
| g_i, Effective Green Time [s]           | 41    | 14    | 14    | 54    | 54   |
| g / C, Green / Cycle                    | 0.52  | 0.17  | 0.17  | 0.69  | 0.69 |
| (v / s)_i Volume / Saturation Flow Rate | 0.40  | 0.05  | 0.15  | 0.37  | 0.35 |
| s, saturation flow rate [veh/h]         | 1860  | 1775  | 1583  | 929   | 1863 |
| c, Capacity [veh/h]                     | 964   | 308   | 275   | 539   | 1278 |
| d1, Uniform Delay [s]                   | 15.20 | 28.40 | 31.55 | 12.79 | 5.93 |
| k, delay calibration                    | 0.50  | 0.11  | 0.23  | 0.50  | 0.50 |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 |
| d2, Incremental Delay [s]               | 5.91  | 0.58  | 14.54 | 5.81  | 1.43 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 |

**Lane Group Results**

|                                       |        |       |        |        |        |
|---------------------------------------|--------|-------|--------|--------|--------|
| X, volume / capacity                  | 0.77   | 0.31  | 0.86   | 0.64   | 0.51   |
| d, Delay for Lane Group [s/veh]       | 21.12  | 28.98 | 46.09  | 18.60  | 7.36   |
| Lane Group LOS                        | C      | C     | D      | B      | A      |
| Critical Lane Group                   | Yes    | No    | Yes    | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 10.98  | 1.61  | 5.32   | 2.58   | 4.43   |
| 50th-Percentile Queue Length [ft/ln]  | 274.44 | 40.15 | 132.98 | 64.52  | 110.83 |
| 95th-Percentile Queue Length [veh/ln] | 16.41  | 2.89  | 9.10   | 4.65   | 7.89   |
| 95th-Percentile Queue Length [ft/ln]  | 410.28 | 72.28 | 227.54 | 116.13 | 197.16 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |       |      |
|---------------------------------|-------|------|-------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 21.12 | 0.00 | 28.98 | 46.09 | 18.60 | 7.36 |
| Movement LOS                    | C     |      | C     | D     | B     | A    |
| d_A, Approach Delay [s/veh]     | 21.12 |      | 41.11 |       | 11.29 |      |
| Approach LOS                    | C     |      | D     |       | B     |      |
| d_I, Intersection Delay [s/veh] | 19.61 |      |       |       |       |      |
| Intersection LOS                | B     |      |       |       |       |      |
| Intersection V/C                | 0.720 |      |       |       |       |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 14: US 1 Alt/Charles Armentrout St

|                  |              |                           |          |
|------------------|--------------|---------------------------|----------|
| Control Type:    | Two-way stop | Delay (sec / veh):        | 10,000.0 |
| Analysis Method: | HCM 2010     | Level Of Service:         | F        |
| Analysis Period: | 15 minutes   | Volume to Capacity (v/c): | 70.395   |

#### Intersection Setup

| Name                   | US 1 Alt                                                                          |        | US 1 ALT                                                                           |        | Charles L Armentrout                                                                |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 25.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1 Alt |        | US 1 ALT |        | Charles L Armentrout |        |
|-----------------------------------------|----------|--------|----------|--------|----------------------|--------|
| Base Volume Input [veh/h]               | 662      | 724    | 623      | 71     | 95                   | 1343   |
| Base Volume Adjustment Factor           | 1.0000   | 1.0000 | 1.0000   | 1.0000 | 1.0000               | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.08     | 2.00   | 2.00     | 2.00   | 3.85                 | 2.17   |
| Growth Rate                             | 1.00     | 1.00   | 1.00     | 1.00   | 1.00                 | 1.00   |
| In-Process Volume [veh/h]               | 0        | 0      | 0        | 0      | 0                    | 0      |
| Site-Generated Trips [veh/h]            | 12       | 16     | 8        | 0      | 0                    | 7      |
| Diverted Trips [veh/h]                  | 0        | 0      | 0        | 0      | 0                    | 0      |
| Pass-by Trips [veh/h]                   | 0        | 0      | 0        | 0      | 0                    | 0      |
| Existing Site Adjustment Volume [veh/h] | 0        | 0      | 0        | 0      | 0                    | 0      |
| Other Volume [veh/h]                    | 0        | 0      | 0        | 0      | 0                    | 0      |
| Total Hourly Volume [veh/h]             | 674      | 740    | 631      | 71     | 95                   | 1350   |
| Peak Hour Factor                        | 0.9000   | 0.9000 | 0.9000   | 0.9000 | 0.9000               | 0.9000 |
| Other Adjustment Factor                 | 1.0000   | 1.0000 | 1.0000   | 1.0000 | 1.0000               | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 187      | 206    | 175      | 20     | 26                   | 375    |
| Total Analysis Volume [veh/h]           | 749      | 822    | 701      | 79     | 106                  | 1500   |
| Pedestrian Volume [ped/h]               | 0        |        | 0        |        | 0                    |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |        |      |      |      |          |         |
|---------------------------------------|--------|------|------|------|----------|---------|
| V/C, Movement V/C Ratio               | 0.90   | 0.01 | 0.01 | 0.00 | 70.39    | 3.42    |
| d_M, Delay for Movement [s/veh]       | 33.54  | 0.00 | 0.00 | 0.00 | 10000.00 | 1114.29 |
| Movement LOS                          | D      | A    | A    | A    | F        | F       |
| 95th-Percentile Queue Length [veh/ln] | 12.14  | 0.00 | 0.00 | 0.00 | 15.61    | 136.81  |
| 95th-Percentile Queue Length [ft/ln]  | 303.62 | 0.00 | 0.00 | 0.00 | 390.21   | 3420.21 |
| d_A, Approach Delay [s/veh]           | 15.99  |      | 0.00 |      | 1700.77  |         |
| Approach LOS                          | C      |      | A    |      | F        |         |
| d_I, Intersection Delay [s/veh]       | 696.63 |      |      |      |          |         |
| Intersection LOS                      | F      |      |      |      |          |         |

### Intersection Level Of Service Report

#### Intersection 15: US 1/Gallatin St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 1.4  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.271

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        | Gallatin St. |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|--------------|--------|
| Approach               | Northbound                                                                        |        | Southbound                                                                         |        | Eastbound    |        |
| Lane Configuration     |  |        |  |        |              |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left         | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00        | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 0      | 0            | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00       | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 30.00                                                                              |        | 0.00         |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00         |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | No           |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        | Gallatin St. |        |
|-----------------------------------------|--------|--------|--------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 23     | 767    | 449    | 45     | 0            | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.11   | 2.05   | 0.00   | 0.00         | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00         | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0      | 12     | 7      | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0            | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 23     | 779    | 456    | 45     | 0            | 0      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000       | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 6      | 216    | 127    | 13     | 0            | 0      |
| Total Analysis Volume [veh/h]           | 26     | 866    | 507    | 50     | 0            | 0      |
| Presence of On-Street Parking           | No     | No     | No     | No     |              |        |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0            | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0            | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 4      |        | 0            |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0      |        | 0            |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 84.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 6.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
|------------------------------|------------|------------|------------|------------|------------|------------|
| Signal group                 | 6          | 6          | 2          | 2          | 5          | 0          |
| Auxiliary Signal Groups      |            |            |            |            |            |            |
| Lead / Lag                   | Lag        | -          | -          | -          | -          | -          |
| Minimum Green [s]            | 4          | 4          | 4          | 4          | 0          | 0          |
| Maximum Green [s]            | 86         | 86         | 86         | 86         | 0          | 0          |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 0.0        | 0.0        |
| All red [s]                  | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Split [s]                    | 90         | 90         | 90         | 90         | 0          | 0          |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 0.0        | 0.0        |
| Walk [s]                     | 0          | 0          | 20         | 20         | 0          | 0          |
| Pedestrian Clearance [s]     | 0          | 0          | 10         | 10         | 0          | 0          |
| Rest In Walk                 |            |            |            |            |            |            |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 0.0        | 0.0        |
| I2, Clearance Lost Time [s]  | 2.0        | 2.0        | 2.0        | 2.0        | 0.0        | 0.0        |
| Minimum Recall               |            | No         | No         |            |            |            |
| Maximum Recall               |            | Yes        | No         |            |            |            |
| Pedestrian Recall            |            | No         | No         |            |            |            |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0       | 50.0       | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |    |
|--------------------------|----|
| Pedestrian Signal Group  | 8  |
| Pedestrian Walk [s]      | 20 |
| Pedestrian Clearance [s] | 10 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | C    | C    |  |
|-----------------------------------------|------|------|------|------|--|
| C, Cycle Length [s]                     | 120  | 120  | 120  | 120  |  |
| L, Total Lost Time per Cycle [s]        | 4.00 | 4.00 | 4.00 | 4.00 |  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00 | 0.00 | 0.00 | 0.00 |  |
| l2, Clearance Lost Time [s]             | 2.00 | 2.00 | 2.00 | 2.00 |  |
| g_i, Effective Green Time [s]           | 106  | 106  | 106  | 106  |  |
| g / C, Green / Cycle                    | 0.88 | 0.88 | 0.88 | 0.88 |  |
| (v / s)_i Volume / Saturation Flow Rate | 0.26 | 0.26 | 0.15 | 0.15 |  |
| s, saturation flow rate [veh/h]         | 1773 | 1693 | 1862 | 1805 |  |
| c, Capacity [veh/h]                     | 1595 | 1494 | 1642 | 1592 |  |
| d1, Uniform Delay [s]                   | 1.11 | 1.12 | 0.98 | 0.99 |  |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 |  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 |  |
| d2, Incremental Delay [s]               | 0.45 | 0.50 | 0.22 | 0.24 |  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 |  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 |  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 |  |

**Lane Group Results**

|                                       |       |       |       |       |  |
|---------------------------------------|-------|-------|-------|-------|--|
| X, volume / capacity                  | 0.29  | 0.29  | 0.17  | 0.17  |  |
| d, Delay for Lane Group [s/veh]       | 1.56  | 1.62  | 1.21  | 1.23  |  |
| Lane Group LOS                        | A     | A     | A     | A     |  |
| Critical Lane Group                   | Yes   | No    | No    | No    |  |
| 50th-Percentile Queue Length [veh/ln] | 0.82  | 0.81  | 0.44  | 0.44  |  |
| 50th-Percentile Queue Length [ft/ln]  | 20.51 | 20.20 | 10.95 | 11.10 |  |
| 95th-Percentile Queue Length [veh/ln] | 1.48  | 1.45  | 0.79  | 0.80  |  |
| 95th-Percentile Queue Length [ft/ln]  | 36.92 | 36.35 | 19.72 | 19.98 |  |



**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |      |      |
|---------------------------------|-------|------|------|------|------|------|
| d_M, Delay for Movement [s/veh] | 1.56  | 1.59 | 1.22 | 1.23 | 0.00 | 0.00 |
| Movement LOS                    | A     | A    | A    | A    |      |      |
| d_A, Approach Delay [s/veh]     | 1.59  |      | 1.22 |      | 0.00 |      |
| Approach LOS                    | A     |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh] | 1.45  |      |      |      |      |      |
| Intersection LOS                | A     |      |      |      |      |      |
| Intersection V/C                | 0.271 |      |      |      |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 90s

SG: 8 30s

SG: 6 90s

### Intersection Level Of Service Report

#### Intersection 16: US 1/Farragut St

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 10.1  |
| Analysis Method: | HCM 2010   | Level Of Service:         | B     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.538 |

#### Intersection Setup

| Name                   | US 1                                                                              |        | Farragut                                                                           |        | US 1                                                                                |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Southbound                                                                        |        | Eastbound                                                                          |        | Northeastbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Thru                                                                              | Right  | Left                                                                               | Right  | Left                                                                                | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 150.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 25.00                                                                              |        | 35.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | No                                                                                |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | Farragut |        | US 1   |        |
|-----------------------------------------|--------|--------|----------|--------|--------|--------|
| Base Volume Input [veh/h]               | 445    | 9      | 47       | 36     | 12     | 757    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.97   | 0.00   | 0.00     | 0.00   | 0.00   | 2.11   |
| Growth Rate                             | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0        | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 7      | 0      | 0        | 0      | 0      | 12     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0        | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0        | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0        | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0        | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0        | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 452    | 9      | 47       | 36     | 12     | 769    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 126    | 3      | 13       | 10     | 3      | 214    |
| Total Analysis Volume [veh/h]           | 502    | 10     | 52       | 40     | 13     | 854    |
| Presence of On-Street Parking           | No     | No     | No       | No     | No     | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0        | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0        | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0        |        | 0      |        |
| Bicycle Volume [bicycles/h]             | 0      |        | 0        |        | 0      |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 78.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 9.00                            |

**Phasing & Timing**

| Control Type                 | Permissive | Permissive | Split | Split | Permissive | Permissive |
|------------------------------|------------|------------|-------|-------|------------|------------|
| Signal group                 | 6          | 6          | 4     | 4     | 2          | 2          |
| Auxiliary Signal Groups      |            |            |       |       |            |            |
| Lead / Lag                   | -          | -          | Lead  | -     | Lag        | -          |
| Minimum Green [s]            | 20         | 20         | 20    | 20    | 20         | 20         |
| Maximum Green [s]            | 89         | 89         | 20    | 20    | 89         | 89         |
| Amber [s]                    | 5.0        | 5.0        | 4.0   | 4.0   | 5.0        | 5.0        |
| All red [s]                  | 1.0        | 1.0        | 1.0   | 1.0   | 1.0        | 1.0        |
| Split [s]                    | 95         | 95         | 25    | 25    | 95         | 95         |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0   | 3.0   | 3.0        | 3.0        |
| Walk [s]                     | 0          | 0          | 0     | 0     | 0          | 0          |
| Pedestrian Clearance [s]     | 0          | 0          | 0     | 0     | 0          | 0          |
| Rest In Walk                 | No         |            | No    |       |            | No         |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0   | 2.0   | 2.0        | 2.0        |
| I2, Clearance Lost Time [s]  | 4.0        | 4.0        | 3.0   | 3.0   | 4.0        | 4.0        |
| Minimum Recall               | No         |            | No    |       |            | No         |
| Maximum Recall               | Yes        |            | Yes   |       |            | Yes        |
| Pedestrian Recall            | No         |            | No    |       |            | No         |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0   | 0.0   | 0.0        | 0.0        |
| Detector Length [ft]         | 50.0       | 50.0       | 50.0  | 50.0  | 0.0        | 0.0        |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00  | 1.00  | 1.00       | 1.00       |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C    | C    | L     | R     | C    |
|-----------------------------------------|------|------|-------|-------|------|
| C, Cycle Length [s]                     | 120  | 120  | 120   | 120   | 120  |
| L, Total Lost Time per Cycle [s]        | 6.00 | 6.00 | 5.00  | 5.00  | 6.00 |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00  | 0.00  | 2.00 |
| l2, Clearance Lost Time [s]             | 4.00 | 4.00 | 3.00  | 3.00  | 4.00 |
| g_i, Effective Green Time [s]           | 89   | 89   | 20    | 20    | 89   |
| g / C, Green / Cycle                    | 0.74 | 0.74 | 0.17  | 0.17  | 0.74 |
| (v / s)_i Volume / Saturation Flow Rate | 0.14 | 0.14 | 0.03  | 0.02  | 0.47 |
| s, saturation flow rate [veh/h]         | 1863 | 1851 | 1810  | 1615  | 1848 |
| c, Capacity [veh/h]                     | 1382 | 1373 | 302   | 269   | 1401 |
| d1, Uniform Delay [s]                   | 4.64 | 4.65 | 42.90 | 42.72 | 7.50 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50  | 0.50  | 0.50 |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |
| d2, Incremental Delay [s]               | 0.30 | 0.30 | 1.24  | 1.16  | 2.06 |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00  | 0.00  | 0.00 |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |
| PF, progression factor                  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |

**Lane Group Results**

|                                       |       |       |       |       |        |
|---------------------------------------|-------|-------|-------|-------|--------|
| X, volume / capacity                  | 0.19  | 0.19  | 0.17  | 0.15  | 0.62   |
| d, Delay for Lane Group [s/veh]       | 4.94  | 4.95  | 44.14 | 43.89 | 9.56   |
| Lane Group LOS                        | A     | A     | D     | D     | A      |
| Critical Lane Group                   | No    | No    | Yes   | No    | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 1.81  | 1.82  | 1.45  | 1.12  | 9.73   |
| 50th-Percentile Queue Length [ft/ln]  | 45.33 | 45.40 | 36.22 | 27.93 | 243.28 |
| 95th-Percentile Queue Length [veh/ln] | 3.26  | 3.27  | 2.61  | 2.01  | 14.85  |
| 95th-Percentile Queue Length [ft/ln]  | 81.59 | 81.72 | 65.19 | 50.28 | 371.18 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |      |      |
|---------------------------------|-------|------|-------|-------|------|------|
| d_M, Delay for Movement [s/veh] | 4.94  | 4.95 | 44.14 | 43.89 | 9.56 | 9.56 |
| Movement LOS                    | A     | A    | D     | D     | A    | A    |
| d_A, Approach Delay [s/veh]     | 4.94  |      | 44.03 |       | 9.56 |      |
| Approach LOS                    | A     |      | D     |       | A    |      |
| d_I, Intersection Delay [s/veh] | 10.11 |      |       |       |      |      |
| Intersection LOS                | B     |      |       |       |      |      |
| Intersection V/C                | 0.538 |      |       |       |      |      |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 95s

SG: 4 25s

SG: 6 95s

### Intersection Level Of Service Report

#### Intersection 17: US 1/43rd Ave

Control Type: Two-way stop  
 Analysis Method: HCM 6th Edition  
 Analysis Period: 15 minutes

Delay (sec / veh): 21.6  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.099

#### Intersection Setup

| Name                   | US 1                                                                              |        | US 1                                                                               |        |                                                                                     |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northeastbound                                                                    |        | Southwestbound                                                                     |        | Southeastbound                                                                      |        |
| Lane Configuration     |  |        |  |        |  |        |
| Turning Movement       | Left                                                                              | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 100.00 |
| Speed [mph]            | 35.00                                                                             |        | 35.00                                                                              |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | US 1   |        | US 1   |        |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 50     | 743    | 467    | 16     | 24     | 70     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 12     | 7      | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 50     | 755    | 474    | 16     | 24     | 70     |
| Peak Hour Factor                        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 13     | 189    | 119    | 4      | 6      | 18     |
| Total Analysis Volume [veh/h]           | 50     | 755    | 474    | 16     | 24     | 70     |
| Pedestrian Volume [ped/h]               | 0      |        | 0      |        | 0      |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |       |       |
|---------------------------------------|------|------|------|------|-------|-------|
| V/C, Movement V/C Ratio               | 0.05 | 0.01 | 0.00 | 0.00 | 0.10  | 0.09  |
| d_M, Delay for Movement [s/veh]       | 8.53 | 0.00 | 0.00 | 0.00 | 21.56 | 11.50 |
| Movement LOS                          | A    | A    | A    | A    | C     | B     |
| 95th-Percentile Queue Length [veh/ln] | 0.15 | 0.00 | 0.00 | 0.00 | 0.70  | 0.70  |
| 95th-Percentile Queue Length [ft/ln]  | 3.67 | 0.00 | 0.00 | 0.00 | 17.52 | 17.52 |
| d_A, Approach Delay [s/veh]           | 0.53 |      | 0.00 |      | 14.07 |       |
| Approach LOS                          | A    |      | A    |      | B     |       |
| d_I, Intersection Delay [s/veh]       | 1.26 |      |      |      |       |       |
| Intersection LOS                      | C    |      |      |      |       |       |

### Intersection Level Of Service Report

#### Intersection 18: US 1/42nd Place/Crittendon Street

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 53.2  |
| Analysis Method: | HCM 2010   | Level Of Service:         | D     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.892 |

#### Intersection Setup

| Name                   | 42nd Pl                                                                           |        |        | Crittenden St                                                                     |        |        | US 1                                                                                |        |        | US 1                                                                                |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Southbound                                                                        |        |        | Eastbound                                                                         |        |        | Northeastbound                                                                      |        |        | Southwestbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Right  | Right2 | Left                                                                              | Thru   | Right  | Left2                                                                               | Left   | Thru   | Thru                                                                                | Right  | Right2 |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 150.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 25.00                                                                             |        |        | 25.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

#### Volumes

| Name                                    | 42nd Pl |        |        | Crittenden St |        |        | US 1   |        |        | US 1   |        |        |
|-----------------------------------------|---------|--------|--------|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 5       | 16     | 0      | 0             | 38     | 355    | 346    | 50     | 778    | 518    | 30     | 5      |
| Base Volume Adjustment Factor           | 1.0000  | 1.0000 | 1.0000 | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00    | 0.00   | 0.00   | 0.00          | 0.00   | 2.00   | 2.14   | 0.00   | 2.17   | 2.05   | 0.00   | 0.00   |
| Growth Rate                             | 1.00    | 1.00   | 1.00   | 1.00          | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0       | 0      | 0      | 0             | 0      | 7      | 12     | 0      | 12     | 7      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 5       | 16     | 0      | 0             | 38     | 362    | 358    | 50     | 790    | 525    | 30     | 5      |
| Peak Hour Factor                        | 0.9000  | 0.9000 | 0.9000 | 1.0000        | 0.9000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000  | 1.0000 | 1.0000 | 1.0000        | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1       | 4      | 0      | 0             | 11     | 101    | 90     | 14     | 219    | 146    | 8      | 1      |
| Total Analysis Volume [veh/h]           | 6       | 18     | 0      | 0             | 42     | 402    | 358    | 56     | 878    | 583    | 33     | 6      |
| Presence of On-Street Parking           | No      |        | No     | No            |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0       | 0      | 0      | 0             | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0       |        |        | 0             |        |        | 0      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0       |        |        | 0             |        |        | 0      |        |        | 0      |        |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 42.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split | Split |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Signal group                 | 4     | 4     | 4     | 0     | 3     | 3     | 0     | 6     | 6     | 2     | 6     | 6     |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |       |       |       |       |
| Lead / Lag                   | Lag   | -     | -     | -     | -     | -     | -     | Lag   | -     | -     | -     | -     |
| Minimum Green [s]            | 5     | 5     | 5     | 0     | 5     | 5     | 0     | 20    | 20    | 20    | 20    | 20    |
| Maximum Green [s]            | 19    | 19    | 19    | 0     | 25    | 25    | 0     | 60    | 60    | 60    | 60    | 60    |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 0.0   | 4.0   | 4.0   | 0.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 0.0   | 1.0   | 1.0   | 0.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   |
| Split [s]                    | 24    | 24    | 24    | 0     | 30    | 30    | 0     | 66    | 66    | 66    | 66    | 66    |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Rest In Walk                 | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 0.0   | 4.0   | 4.0   | 6.0   | 4.0   | 4.0   |
| Minimum Recall               | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| Maximum Recall               | No    |       |       |       | No    |       |       |       | Yes   | Yes   |       |       |
| Pedestrian Recall            | No    |       |       |       | No    |       |       |       | No    | No    |       |       |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 50.0  | 50.0  | 50.0  | 0.0   | 50.0  | 50.0  | 0.0   | 50.0  | 50.0  | 50.0  | 50.0  | 50.0  |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C      | L     | C     | C     | C     |
|-----------------------------------------|-------|--------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 120   | 120    | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00   | 6.00  | 6.00  | 8.00  | 8.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00   | 2.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00   | 4.00  | 4.00  | 6.00  | 6.00  |
| g_i, Effective Green Time [s]           | 3     | 25     | 76    | 76    | 74    | 74    |
| g / C, Green / Cycle                    | 0.02  | 0.21   | 0.63  | 0.63  | 0.62  | 0.62  |
| (v / s)_i Volume / Saturation Flow Rate | 0.01  | 0.27   | 0.52  | 0.25  | 0.17  | 0.17  |
| s, saturation flow rate [veh/h]         | 1660  | 1638   | 800   | 3541  | 1862  | 1821  |
| c, Capacity [veh/h]                     | 40    | 341    | 487   | 2246  | 1150  | 1125  |
| d1, Uniform Delay [s]                   | 57.99 | 47.50  | 27.03 | 10.67 | 10.53 | 10.58 |
| k, delay calibration                    | 0.11  | 0.50   | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 13.74 | 155.29 | 16.77 | 0.51  | 0.58  | 0.61  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |        |        |
|---------------------------------------|-------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.60  | 1.30   | 0.85   | 0.39   | 0.27   | 0.28   |
| d, Delay for Lane Group [s/veh]       | 71.74 | 202.79 | 43.80  | 11.18  | 11.11  | 11.19  |
| Lane Group LOS                        | E     | F      | D      | B      | B      | B      |
| Critical Lane Group                   | Yes   | Yes    | Yes    | No     | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 0.88  | 24.95  | 12.92  | 5.45   | 3.78   | 3.80   |
| 50th-Percentile Queue Length [ft/ln]  | 22.00 | 623.82 | 322.96 | 136.23 | 94.39  | 94.93  |
| 95th-Percentile Queue Length [veh/ln] | 1.58  | 37.69  | 18.81  | 9.28   | 6.80   | 6.83   |
| 95th-Percentile Queue Length [ft/ln]  | 39.60 | 942.20 | 470.33 | 231.94 | 169.89 | 170.87 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |        |        |        |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 71.74 | 71.74 | 71.74 | 0.00   | 202.79 | 202.79 | 43.80 | 43.80 | 11.18 | 11.15 | 11.19 | 11.19 |
| Movement LOS                    | E     | E     | E     |        | F      | F      | D     | D     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 71.74 |       |       | 202.79 |        |        | 21.63 |       |       | 11.15 |       |       |
| Approach LOS                    | E     |       |       | F      |        |        | C     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 53.17 |       |       |        |        |        |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |        |        |        |       |       |       |       |       |       |
| Intersection V/C                | 0.892 |       |       |        |        |        |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**  
**Intersection 19: US 1/41st Place/Charles Armentrout Dr**

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 33.0  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.904 |

**Intersection Setup**

| Name                   | US 1                                                                              |        |        | US 1                                                                              |        |        | Charles L Armentrout                                                                |        |        | 41st                                                                                |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 200.00                                                                            | 100.00 | 200.00 | 200.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 43.00                                                                             |        |        | 35.00                                                                             |        |        | 25.00                                                                               |        |        | 25.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                    | US 1   |        |        | US 1   |        |        | Charles L Armentrout |        |        | 41st   |        |        |
|-----------------------------------------|--------|--------|--------|--------|--------|--------|----------------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 1      | 675    | 563    | 592    | 356    | 2      | 271                  | 3      | 474    | 2      | 2      | 2      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00   | 2.00   | 2.38   | 2.14   | 2.00   | 0.00   | 2.00                 | 0.00   | 2.21   | 0.00   | 0.00   | 0.00   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00                 | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 12     | 0      | 7      | 7      | 0      | 0                    | 0      | 12     | 0      | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 1      | 687    | 563    | 599    | 363    | 2      | 271                  | 3      | 486    | 2      | 2      | 2      |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000               | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0      | 191    | 156    | 166    | 101    | 1      | 75                   | 1      | 135    | 1      | 1      | 1      |
| Total Analysis Volume [veh/h]           | 1      | 763    | 626    | 666    | 403    | 2      | 301                  | 3      | 540    | 2      | 2      | 2      |
| Presence of On-Street Parking           | No     |        | No     | No     |        | No     | No                   |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0                    | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 4      |        |        | 0      |        |        | 0                    |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0      |        |        | 0                    |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 120                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 42.0                            |
| Offset Reference          | LagEnd                          |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Overlap | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 6       | 6       | 6       | 5        | 2       | 2       | 8       | 8       | 2       | 4       | 4       | 4       |
| Auxiliary Signal Groups      |         |         |         |          |         |         |         |         | 2,5     |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lead     | -       | -       | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 20      | 20      | 20      | 5        | 20      | 20      | 8       | 8       | 20      | 8       | 8       | 8       |
| Maximum Green [s]            | 49      | 49      | 49      | 25       | 78      | 78      | 30      | 30      | 78      | 30      | 30      | 30      |
| Amber [s]                    | 5.0     | 5.0     | 5.0     | 4.0      | 5.0     | 5.0     | 4.0     | 4.0     | 5.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0     | 1.0     | 1.0     | 1.0      | 1.0     | 1.0     | 2.0     | 2.0     | 1.0     | 2.0     | 2.0     | 2.0     |
| Split [s]                    | 54      | 54      | 54      | 30       | 84      | 84      | 36      | 36      | 84      | 36      | 36      | 36      |
| Vehicle Extension [s]        | 6.0     | 6.0     | 6.0     | 3.0      | 6.0     | 6.0     | 3.0     | 3.0     | 6.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |          | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0     | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| Minimum Recall               |         | No      |         | No       | No      |         |         | No      | No      |         | No      |         |
| Maximum Recall               |         | Yes     |         | No       | Yes     |         |         | No      | Yes     |         | No      |         |
| Pedestrian Recall            |         | No      |         | No       | No      |         |         | No      | No      |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 50.0    | 50.0    | 50.0    | 50.0     | 50.0    | 50.0    | 50.0    | 50.0    | 0.0     | 50.0    | 50.0    | 50.0    |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C    | C    | C     | R    | C     |
|-----------------------------------------|-------|-------|-------|-------|------|------|-------|------|-------|
| C, Cycle Length [s]                     | 120   | 120   | 120   | 120   | 120  | 120  | 120   | 120  | 120   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00  | 6.00  | 6.00  | 6.00 | 6.00 | 6.00  | 5.50 | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 2.00  | 0.00 | 2.00  |
| l2, Clearance Lost Time [s]             | 4.00  | 4.00  | 4.00  | 0.00  | 4.00 | 4.00 | 4.00  | 0.00 | 4.00  |
| g_i, Effective Green Time [s]           | 51    | 51    | 51    | 81    | 81   | 81   | 27    | 81   | 27    |
| g / C, Green / Cycle                    | 0.43  | 0.43  | 0.43  | 0.68  | 0.68 | 0.68 | 0.22  | 0.68 | 0.22  |
| (v / s)_i Volume / Saturation Flow Rate | 0.00  | 0.22  | 0.40  | 0.62  | 0.11 | 0.11 | 0.21  | 0.34 | 0.00  |
| s, saturation flow rate [veh/h]         | 996   | 3547  | 1577  | 1069  | 1863 | 1860 | 1462  | 1580 | 1870  |
| c, Capacity [veh/h]                     | 427   | 1512  | 673   | 701   | 1260 | 1258 | 387   | 1069 | 458   |
| d1, Uniform Delay [s]                   | 23.98 | 25.16 | 32.74 | 20.35 | 7.05 | 7.05 | 45.38 | 9.55 | 36.29 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50 | 0.50 | 0.29  | 0.50 | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  |
| d2, Incremental Delay [s]               | 0.01  | 1.21  | 21.34 | 23.75 | 0.27 | 0.27 | 9.09  | 1.71 | 0.01  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  |

**Lane Group Results**

|                                       |       |        |        |        |       |       |        |        |       |
|---------------------------------------|-------|--------|--------|--------|-------|-------|--------|--------|-------|
| X, volume / capacity                  | 0.00  | 0.50   | 0.93   | 0.95   | 0.16  | 0.16  | 0.79   | 0.51   | 0.01  |
| d, Delay for Lane Group [s/veh]       | 23.99 | 26.36  | 54.07  | 44.10  | 7.33  | 7.33  | 54.47  | 11.26  | 36.30 |
| Lane Group LOS                        | C     | C      | D      | D      | A     | A     | D      | B      | D     |
| Critical Lane Group                   | No    | No     | Yes    | Yes    | No    | No    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.02  | 7.86   | 20.22  | 12.81  | 1.84  | 1.84  | 9.88   | 7.17   | 0.14  |
| 50th-Percentile Queue Length [ft/ln]  | 0.47  | 196.43 | 505.57 | 320.35 | 46.02 | 45.95 | 247.00 | 179.34 | 3.53  |
| 95th-Percentile Queue Length [veh/ln] | 0.03  | 12.45  | 27.60  | 18.68  | 3.31  | 3.31  | 15.03  | 11.57  | 0.25  |
| 95th-Percentile Queue Length [ft/ln]  | 0.84  | 311.36 | 689.95 | 467.12 | 82.84 | 82.71 | 375.87 | 289.15 | 6.36  |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 23.99 | 26.36 | 54.07 | 44.10 | 7.33 | 7.33 | 54.47 | 54.47 | 11.26 | 36.30 | 36.30 | 36.30 |
| Movement LOS                    | C     | C     | D     | D     | A    | A    | D     | D     | B     | D     | D     | D     |
| d_A, Approach Delay [s/veh]     | 38.84 |       |       | 30.19 |      |      | 26.82 |       |       | 36.30 |       |       |
| Approach LOS                    | D     |       |       | C     |      |      | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 32.98 |       |       |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.904 |       |       |       |      |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 20: MD 410/Toledo Terrace

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 115.5  
 Level Of Service: F  
 Volume to Capacity (v/c): 8.025

#### Intersection Setup

| Name                   |                                                                                   |        |        | Toledo Terrace                                                                    |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 500.00                                                                              | 100.00 | 900.00 | 175.00                                                                              | 100.00 | 175.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 50.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Toledo Terrace |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 99     | 32     | 93     | 127            | 19     | 283    | 387    | 1306   | 145    | 81     | 998    | 155    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.44   | 0.00   | 2.50   | 2.38           | 0.00   | 1.96   | 2.07   | 2.00   | 1.92   | 2.00   | 2.05   | 3.85   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00           | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 22     | 0      | 0      | 0              | 0      | 0      | 0      | 24     | 41     | 0      | 13     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 121    | 32     | 93     | 127            | 19     | 283    | 387    | 1330   | 186    | 81     | 1011   | 155    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000         | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 34     | 9      | 26     | 35             | 5      | 79     | 108    | 369    | 52     | 23     | 281    | 43     |
| Total Analysis Volume [veh/h]           | 134    | 36     | 103    | 141            | 21     | 314    | 430    | 1478   | 207    | 90     | 1123   | 172    |
| Presence of On-Street Parking           | No     |        | No     | No             |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0              | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 4      |        |        | 2              |        |        | 1      |        |        | 5      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0              |        |        | 0      |        |        | 0      |        |        |



**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 66.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|---------|---------|
| Signal group                 | 8       | 8       | 8       | 4       | 4       | 4       | 1        | 6       | 6       | 2       | 2       | 2       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |         |         |         |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | Lead     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 8       | 8       | 8       | 8       | 8       | 8       | 5        | 20      | 20      | 20      | 20      | 20      |
| Maximum Green [s]            | 39      | 39      | 39      | 39      | 39      | 39      | 31       | 99      | 99      | 63      | 63      | 63      |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0      | 4.5     | 4.5     | 4.5     | 4.5     | 4.5     |
| All red [s]                  | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 1.0      | 1.5     | 1.5     | 1.5     | 1.5     | 1.5     |
| Split [s]                    | 45      | 45      | 45      | 45      | 45      | 45      | 36       | 105     | 105     | 69      | 69      | 69      |
| Vehicle Extension [s]        | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0      | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         |         | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | Yes     |         |         | Yes     |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C       | R     | C       | R     | L     | C     | R    | L     | C     | R     |
|-----------------------------------------|---------|-------|---------|-------|-------|-------|------|-------|-------|-------|
| C, Cycle Length [s]                     | 150     | 150   | 150     | 150   | 150   | 150   | 150  | 150   | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 6.00    | 6.00  | 6.00    | 6.00  | 6.00  | 6.00  | 6.00 | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00    | 0.00  | 2.00    | 0.00  | 0.00  | 0.00  | 0.00 | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 4.00    | 4.00  | 4.00    | 4.00  | 0.00  | 4.00  | 4.00 | 4.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 39      | 39    | 39      | 39    | 99    | 99    | 99   | 70    | 70    | 70    |
| g / C, Green / Cycle                    | 0.26    | 0.26  | 0.26    | 0.26  | 0.66  | 0.66  | 0.66 | 0.47  | 0.47  | 0.47  |
| (v / s)_i Volume / Saturation Flow Rate | 4.82    | 0.07  | 6.94    | 0.20  | 0.51  | 0.42  | 0.13 | 0.25  | 0.32  | 0.11  |
| s, saturation flow rate [veh/h]         | 35      | 1566  | 23      | 1582  | 845   | 3547  | 1580 | 356   | 3545  | 1552  |
| c, Capacity [veh/h]                     | 52      | 406   | 51      | 410   | 506   | 2343  | 1044 | 124   | 1659  | 726   |
| d1, Uniform Delay [s]                   | 69.94   | 44.03 | 72.12   | 51.32 | 30.88 | 14.82 | 9.94 | 61.48 | 31.06 | 23.87 |
| k, delay calibration                    | 0.50    | 0.11  | 0.50    | 0.26  | 0.50  | 0.50  | 0.50 | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00    | 1.00  | 1.00    | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1066.60 | 0.32  | 1030.06 | 6.93  | 16.24 | 1.30  | 0.43 | 30.77 | 2.24  | 0.77  |
| d3, Initial Queue Delay [s]             | 0.00    | 0.00  | 0.00    | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00    | 1.00  | 1.00    | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00    | 1.00  | 1.00    | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |         |        |         |        |        |        |        |        |        |        |
|---------------------------------------|---------|--------|---------|--------|--------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 3.26    | 0.25   | 3.18    | 0.77   | 0.85   | 0.63   | 0.20   | 0.73   | 0.68   | 0.24   |
| d, Delay for Lane Group [s/veh]       | 1136.55 | 44.35  | 1102.19 | 58.25  | 47.12  | 16.12  | 10.37  | 92.24  | 33.30  | 24.63  |
| Lane Group LOS                        | F       | D      | F       | E      | D      | B      | B      | F      | C      | C      |
| Critical Lane Group                   | No      | No     | Yes     | No     | Yes    | No     | No     | No     | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 17.45   | 3.12   | 16.55   | 11.74  | 8.16   | 13.55  | 2.59   | 4.49   | 15.80  | 3.75   |
| 50th-Percentile Queue Length [ft/ln]  | 436.22  | 77.98  | 413.81  | 293.61 | 204.12 | 338.82 | 64.80  | 112.22 | 394.91 | 93.79  |
| 95th-Percentile Queue Length [veh/ln] | 31.41   | 5.61   | 29.79   | 17.36  | 12.85  | 19.59  | 4.67   | 7.96   | 22.31  | 6.75   |
| 95th-Percentile Queue Length [ft/ln]  | 785.19  | 140.37 | 744.85  | 434.12 | 321.27 | 489.75 | 116.64 | 199.08 | 557.86 | 168.82 |

**Movement, Approach, & Intersection Results**

|                                 |         |         |       |         |         |       |       |       |       |       |       |       |
|---------------------------------|---------|---------|-------|---------|---------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 1136.55 | 1136.55 | 44.35 | 1102.19 | 1102.19 | 58.25 | 47.12 | 16.12 | 10.37 | 92.24 | 33.30 | 24.63 |
| Movement LOS                    | F       | F       | D     | F       | F       | E     | D     | B     | B     | F     | C     | C     |
| d_A, Approach Delay [s/veh]     | 724.47  |         |       | 413.54  |         |       | 21.86 |       |       | 36.05 |       |       |
| Approach LOS                    | F       |         |       | F       |         |       | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 115.51  |         |       |         |         |       |       |       |       |       |       |       |
| Intersection LOS                | F       |         |       |         |         |       |       |       |       |       |       |       |
| Intersection V/C                | 8.025   |         |       |         |         |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 21: MD 410/Editors Park Dr

Control Type: Two-way stop  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 4,351.3  
 Level Of Service: F  
 Volume to Capacity (v/c): 8.839

#### Intersection Setup

| Name                   | Editors Park Dr                                                                   |        | MD 410                                                                             |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        | Eastbound                                                                          |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |  |        |  |        |        |
| Turning Movement       | Left                                                                              | Right  | Thru                                                                               | Right  | U-turn                                                                              | Left   | Thru   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0                                                                                  | 1      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 200.00 | 150.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        | 45.00                                                                              |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Editors Park Dr |        | MD 410 |        | MD 410 |        |        |
|-----------------------------------------|-----------------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 64              | 67     | 1460   | 109    | 1      | 35     | 1282   |
| Base Volume Adjustment Factor           | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.85            | 0.00   | 2.00   | 1.64   | 0.00   | 1.89   | 2.05   |
| Growth Rate                             | 1.00            | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0               | 64     | 24     | 0      | 0      | 121    | 13     |
| Diverted Trips [veh/h]                  | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0               | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 64              | 131    | 1484   | 109    | 1      | 156    | 1295   |
| Peak Hour Factor                        | 0.9000          | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000          | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 18              | 36     | 412    | 30     | 0      | 43     | 360    |
| Total Analysis Volume [veh/h]           | 71              | 146    | 1649   | 121    | 1      | 173    | 1439   |
| Pedestrian Volume [ped/h]               | 0               |        | 0      |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |         |         |      |      |       |       |      |
|---------------------------------------|---------|---------|------|------|-------|-------|------|
| V/C, Movement V/C Ratio               | 8.84    | 0.46    | 0.02 | 0.00 | 0.02  | 0.50  | 0.01 |
| d_M, Delay for Movement [s/veh]       | 4351.30 | 3914.38 | 0.00 | 0.00 | 87.64 | 26.19 | 0.00 |
| Movement LOS                          | F       | F       | A    | A    | F     | D     | A    |
| 95th-Percentile Queue Length [veh/ln] | 27.20   | 27.20   | 0.00 | 0.00 | 2.34  | 2.34  | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 679.96  | 679.96  | 0.00 | 0.00 | 58.58 | 58.58 | 0.00 |
| d_A, Approach Delay [s/veh]           | 4057.34 |         | 0.00 |      | 2.86  |       |      |
| Approach LOS                          | F       |         | A    |      | A     |       |      |
| d_I, Intersection Delay [s/veh]       | 245.85  |         |      |      |       |       |      |
| Intersection LOS                      | F       |         |      |      |       |       |      |

### Intersection Level Of Service Report

#### Intersection 22: MD 410/Prince George's Plaza

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 24.6  |
| Analysis Method: | HCM 2010   | Level Of Service:         | C     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.535 |

#### Intersection Setup

| Name                   | Metro                                                                             |        |        | PG Plaza                                                                          |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 2                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 250.00                                                                            | 100.00 | 250.00 | 225.00                                                                              | 100.00 | 100.00 | 325.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Metro  |        |        | PG Plaza |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 175    | 17     | 165    | 126      | 12     | 34     | 132    | 1307   | 62     | 98     | 1139   | 70     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 1.54   | 3.85   | 2.22   | 0.00     | 0.00   | 3.85   | 2.22   | 2.07   | 1.74   | 2.21   | 2.00   | 3.85   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 88     | 0      | 0      | 134    | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 175    | 17     | 165    | 126      | 12     | 34     | 132    | 1395   | 62     | 98     | 1273   | 70     |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 49     | 5      | 46     | 35       | 3      | 9      | 37     | 388    | 17     | 27     | 354    | 19     |
| Total Analysis Volume [veh/h]           | 194    | 19     | 183    | 140      | 13     | 38     | 147    | 1550   | 69     | 109    | 1414   | 78     |
| Presence of On-Street Parking           | No     |        | No     | No       |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0        |        |        | 0      |        |        | 0      |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0        |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 75.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 3     | 3     | 3     | 4     | 4     | 4     | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |          |         |         |          |         |         |
| Lead / Lag                   | Lag   | -     | -     | Lag   | -     | -     | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 5     | 5     | 5     | 5     | 5        | 20      | 20      | 5        | 20      | 20      |
| Maximum Green [s]            | 24    | 24    | 24    | 24    | 24    | 24    | 25       | 54      | 54      | 25       | 54      | 54      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   | 1.0      | 1.5     | 1.5     | 1.0      | 1.5     | 1.5     |
| Split [s]                    | 30    | 30    | 30    | 30    | 30    | 30    | 30       | 60      | 60      | 30       | 60      | 60      |
| Vehicle Extension [s]        | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5      | 5.0     | 5.0     | 2.5      | 5.0     | 5.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       | No    |       |       | No    |       |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.5   | 3.5   | 3.5   | 3.5   | 3.5   | 3.5   | 3.0      | 4.0     | 4.0     | 3.0      | 4.0     | 4.0     |
| Minimum Recall               |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    |       |       | No    |       | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 294.0   | 294.0   | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 30.0  | 30.0  | 30.0  | 30.0     | 6.0     | 6.0     | 30.0     | 5.0     | 5.0     |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | L     | C     | R     | L     | C     | C     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 5.50  | 5.50  | 5.50  | 5.50  | 5.50  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.50  | 3.50  | 3.50  | 3.50  | 3.50  | 0.00  | 4.00  | 4.00  | 0.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 21    | 21    | 8     | 8     | 8     | 103   | 93    | 93    | 103   | 92    | 92    |
| g / C, Green / Cycle                    | 0.14  | 0.14  | 0.06  | 0.06  | 0.06  | 0.69  | 0.62  | 0.62  | 0.69  | 0.61  | 0.61  |
| (v / s)_i Volume / Saturation Flow Rate | 0.06  | 0.13  | 0.04  | 0.01  | 0.02  | 0.29  | 0.30  | 0.30  | 0.25  | 0.28  | 0.05  |
| s, saturation flow rate [veh/h]         | 3461  | 1577  | 3514  | 1900  | 1555  | 507   | 3544  | 1821  | 433   | 5074  | 1555  |
| c, Capacity [veh/h]                     | 490   | 223   | 197   | 106   | 87    | 362   | 2190  | 1125  | 316   | 3105  | 952   |
| d1, Uniform Delay [s]                   | 58.54 | 63.38 | 69.62 | 67.30 | 68.52 | 10.93 | 15.68 | 15.69 | 11.17 | 15.66 | 11.89 |
| k, delay calibration                    | 0.08  | 0.24  | 0.08  | 0.08  | 0.08  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.39  | 23.35 | 3.54  | 0.38  | 2.55  | 3.37  | 0.78  | 1.52  | 2.96  | 0.48  | 0.17  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |       |       |       |        |        |       |        |       |
|---------------------------------------|--------|--------|--------|-------|-------|-------|--------|--------|-------|--------|-------|
| X, volume / capacity                  | 0.40   | 0.90   | 0.71   | 0.12  | 0.44  | 0.41  | 0.49   | 0.49   | 0.34  | 0.46   | 0.08  |
| d, Delay for Lane Group [s/veh]       | 58.93  | 86.73  | 73.16  | 67.68 | 71.07 | 14.30 | 16.47  | 17.21  | 14.13 | 16.14  | 12.06 |
| Lane Group LOS                        | E      | F      | E      | E     | E     | B     | B      | B      | B     | B      | B     |
| Critical Lane Group                   | No     | Yes    | Yes    | No    | No    | No    | No     | Yes    | Yes   | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.41   | 9.07   | 2.75   | 0.49  | 1.48  | 1.84  | 9.68   | 10.19  | 1.35  | 8.36   | 1.08  |
| 50th-Percentile Queue Length [ft/ln]  | 85.13  | 226.67 | 68.86  | 12.21 | 37.04 | 46.05 | 242.03 | 254.82 | 33.74 | 209.03 | 26.95 |
| 95th-Percentile Queue Length [veh/ln] | 6.13   | 14.00  | 4.96   | 0.88  | 2.67  | 3.32  | 14.78  | 15.43  | 2.43  | 13.10  | 1.94  |
| 95th-Percentile Queue Length [ft/ln]  | 153.24 | 350.12 | 123.95 | 21.98 | 66.67 | 82.90 | 369.60 | 385.72 | 60.74 | 327.58 | 48.51 |



**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 58.93 | 86.73 | 86.73 | 73.16 | 67.68 | 71.07 | 14.30 | 16.70 | 17.21 | 14.13 | 16.14 | 12.06 |
| Movement LOS                    | E     | F     | F     | E     | E     | E     | B     | B     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 73.11 |       |       | 72.37 |       |       | 16.52 |       |       | 15.81 |       |       |
| Approach LOS                    | E     |       |       | E     |       |       | B     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 24.60 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.535 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 23: MD 410/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 120.3  
 Level Of Service: F  
 Volume to Capacity (v/c): 1.021

#### Intersection Setup

| Name                   |                                                                                   |        |        | Belcrest Rd                                                                       |        |        | MD 410                                                                              |        |        | MD 410                                                                              |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 1                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 250.00                                                                            | 100.00 | 100.00 | 250.00                                                                            | 100.00 | 100.00 | 225.00                                                                              | 100.00 | 100.00 | 225.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Belcrest Rd |        |        | MD 410 |        |        | MD 410 |        |        |
|-----------------------------------------|--------|--------|--------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 363    | 387    | 6      | 310         | 601    | 126    | 210    | 1114   | 276    | 239    | 867    | 122    |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.21   | 2.00   | 3.85   | 2.00        | 2.21   | 2.63   | 2.00   | 2.00   | 2.38   | 2.63   | 2.00   | 2.63   |
| Growth Rate                             | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 71     | 0      | 0      | 20          | 0      | 10     | 29     | 21     | 38     | 17     | 53     | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 434    | 387    | 6      | 330         | 601    | 136    | 239    | 1135   | 314    | 256    | 920    | 122    |
| Peak Hour Factor                        | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 121    | 108    | 2      | 92          | 167    | 38     | 66     | 315    | 87     | 71     | 256    | 34     |
| Total Analysis Volume [veh/h]           | 482    | 430    | 7      | 367         | 668    | 151    | 266    | 1261   | 349    | 284    | 1022   | 136    |
| Presence of On-Street Parking           | No     |        | No     | No          |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0      | 0      | 0      | 0           | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 26     |        |        | 10          |        |        | 91     |        |        | 71     |        |        |
| Bicycle Volume [bicycles/h]             | 0      |        |        | 0           |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 60.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 4     | 4     | 4     | 3     | 3     | 3     | 1        | 6       | 6       | 5        | 2       | 2       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |          |         |         |          |         |         |
| Lead / Lag                   | Lag   | -     | -     | Lag   | -     | -     | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 5     | 5     | 5     | 5     | 5     | 5     | 5        | 20      | 20      | 5        | 20      | 20      |
| Maximum Green [s]            | 29    | 29    | 29    | 32    | 32    | 32    | 17       | 53      | 53      | 11       | 47      | 47      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| All red [s]                  | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| Split [s]                    | 35    | 35    | 35    | 38    | 38    | 38    | 23       | 60      | 60      | 17       | 54      | 54      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0      | 5.0     | 5.0     | 3.0      | 5.0     | 5.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |       | No    |       |       | No    |       |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      | 2.0     | 2.0     | 2.0      | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0      | 4.5     | 4.5     | 4.0      | 4.5     | 4.5     |
| Minimum Recall               |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Maximum Recall               |       | No    |       |       | No    |       | No       | Yes     |         | No       | Yes     |         |
| Pedestrian Recall            |       | No    |       |       | No    |       | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 30.0  | 30.0  | 30.0  | 30.0  | 30.0     | 5.0     | 5.0     | 30.0     | 5.0     | 5.0     |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | L      | C     | R     | L      | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|--------|-------|-------|--------|-------|-------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150   | 150   | 150   | 150    | 150   | 150   | 150    | 150   | 150   |
| L, Total Lost Time per Cycle [s]        | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00   | 6.50  | 6.50  | 6.00   | 6.50  | 6.50  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00   | 4.50  | 4.50  | 4.00   | 4.50  | 4.50  |
| g_i, Effective Green Time [s]           | 28    | 28    | 28    | 32    | 32    | 32    | 17     | 54    | 54    | 11     | 48    | 48    |
| g / C, Green / Cycle                    | 0.19  | 0.19  | 0.19  | 0.21  | 0.21  | 0.21  | 0.11   | 0.36  | 0.36  | 0.07   | 0.32  | 0.32  |
| (v / s)_i Volume / Saturation Flow Rate | 0.17  | 0.17  | 0.17  | 0.21  | 0.25  | 0.24  | 0.15   | 0.36  | 0.23  | 0.16   | 0.29  | 0.09  |
| s, saturation flow rate [veh/h]         | 1770  | 1813  | 1682  | 1774  | 1859  | 1475  | 1774   | 3547  | 1543  | 1763   | 3547  | 1559  |
| c, Capacity [veh/h]                     | 335   | 343   | 318   | 379   | 397   | 315   | 201    | 1280  | 557   | 129    | 1138  | 500   |
| d1, Uniform Delay [s]                   | 59.72 | 59.72 | 59.76 | 58.48 | 58.97 | 58.97 | 66.47  | 47.53 | 39.58 | 69.47  | 48.59 | 37.89 |
| k, delay calibration                    | 0.34  | 0.34  | 0.34  | 0.39  | 0.50  | 0.50  | 0.50   | 0.50  | 0.50  | 0.50   | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 25.07 | 24.64 | 26.59 | 33.98 | 96.17 | 94.48 | 175.45 | 21.92 | 5.26  | 562.46 | 11.23 | 1.34  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |        |        |        |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.92   | 0.92   | 0.93   | 0.97   | 1.16   | 1.14   | 1.32   | 0.99   | 0.63   | 2.20   | 0.90   | 0.27   |
| d, Delay for Lane Group [s/veh]       | 84.79  | 84.36  | 86.35  | 92.46  | 155.14 | 153.45 | 241.92 | 69.46  | 44.85  | 631.93 | 59.82  | 39.23  |
| Lane Group LOS                        | F      | F      | F      | F      | F      | F      | F      | E      | D      | F      | E      | D      |
| Critical Lane Group                   | No     | No     | Yes    | No     | Yes    | No     | No     | Yes    | No     | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 13.89  | 14.18  | 13.37  | 17.40  | 25.67  | 20.22  | 17.37  | 26.45  | 11.21  | 25.10  | 19.52  | 3.87   |
| 50th-Percentile Queue Length [ft/ln]  | 347.13 | 354.45 | 334.31 | 435.05 | 641.77 | 505.59 | 434.34 | 661.19 | 280.24 | 627.51 | 487.93 | 96.72  |
| 95th-Percentile Queue Length [veh/ln] | 20.00  | 20.35  | 19.37  | 24.24  | 36.82  | 29.61  | 26.93  | 34.88  | 16.70  | 39.82  | 26.76  | 6.96   |
| 95th-Percentile Queue Length [ft/ln]  | 499.91 | 508.84 | 484.25 | 606.08 | 920.46 | 740.36 | 673.23 | 872.04 | 417.51 | 995.56 | 669.06 | 174.10 |

**Movement, Approach, & Intersection Results**

|                                 |        |       |       |        |        |        |        |       |       |        |       |       |
|---------------------------------|--------|-------|-------|--------|--------|--------|--------|-------|-------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 84.63  | 85.69 | 86.35 | 92.46  | 154.61 | 153.45 | 241.92 | 69.46 | 44.85 | 631.93 | 59.82 | 39.23 |
| Movement LOS                    | F      | F     | F     | F      | F      | F      | F      | E     | D     | F      | E     | D     |
| d_A, Approach Delay [s/veh]     | 85.14  |       |       | 135.23 |        |        | 89.33  |       |       | 170.55 |       |       |
| Approach LOS                    | F      |       |       | F      |        |        | F      |       |       | F      |       |       |
| d_I, Intersection Delay [s/veh] | 120.26 |       |       |        |        |        |        |       |       |        |       |       |
| Intersection LOS                | F      |       |       |        |        |        |        |       |       |        |       |       |
| Intersection V/C                | 1.021  |       |       |        |        |        |        |       |       |        |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 24: MD 410/MD 500/Adelphi Rd

|                  |            |                           |       |
|------------------|------------|---------------------------|-------|
| Control Type:    | Signalized | Delay (sec / veh):        | 212.1 |
| Analysis Method: | HCM 2010   | Level Of Service:         | F     |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.199 |

#### Intersection Setup

| Name                   | Adelphi Rd |        |        | MD 410    |        |        | MD 410    |        |        | MD 500         |        |        |
|------------------------|------------|--------|--------|-----------|--------|--------|-----------|--------|--------|----------------|--------|--------|
| Approach               | Southbound |        |        | Eastbound |        |        | Westbound |        |        | Northeastbound |        |        |
| Lane Configuration     |            |        |        |           |        |        |           |        |        |                |        |        |
| Turning Movement       | Left       | Thru   | Right  | Left      | Thru   | Right  | Left      | Thru   | Right  | Left           | Thru   | Right  |
| Lane Width [ft]        | 12.00      | 12.00  | 12.00  | 12.00     | 12.00  | 12.00  | 12.00     | 12.00  | 12.00  | 12.00          | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1          | 0      | 1      | 1         | 0      | 0      | 1         | 0      | 1      | 0              | 0      | 0      |
| Pocket Length [ft]     | 350.00     | 100.00 | 150.00 | 300.00    | 100.00 | 100.00 | 350.00    | 100.00 | 150.00 | 100.00         | 100.00 | 100.00 |
| Speed [mph]            | 35.00      |        |        | 35.00     |        |        | 35.00     |        |        | 35.00          |        |        |
| Grade [%]              | 0.00       |        |        | 0.00      |        |        | 0.00      |        |        | 0.00           |        |        |
| Crosswalk              | Yes        |        |        | Yes       |        |        | Yes       |        |        | Yes            |        |        |

#### Volumes

| Name                                    | Adelphi Rd |        |        | MD 410 |        |        | MD 410 |        |        | MD 500 |        |        |
|-----------------------------------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 525        | 352    | 47     | 101    | 1302   | 54     | 479    | 1205   | 400    | 46     | 727    | 497    |
| Base Volume Adjustment Factor           | 1.0000     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00       | 2.00   | 1.56   | 2.63   | 2.00   | 0.00   | 2.00   | 2.04   | 2.09   | 3.85   | 2.13   | 2.15   |
| Growth Rate                             | 1.00       | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0          | 12     | 6      | 0      | 41     | 0      | 36     | 76     | 0      | 30     | 7      | 22     |
| Diverted Trips [veh/h]                  | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 525        | 364    | 53     | 101    | 1343   | 54     | 515    | 1281   | 400    | 76     | 734    | 519    |
| Peak Hour Factor                        | 0.9000     | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 146        | 101    | 15     | 28     | 373    | 15     | 143    | 356    | 111    | 21     | 204    | 144    |
| Total Analysis Volume [veh/h]           | 583        | 404    | 59     | 112    | 1492   | 60     | 572    | 1423   | 444    | 84     | 816    | 577    |
| Presence of On-Street Parking           | No         |        | No     | No     |        | No     | No     |        | No     | No     |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Pedestrian Volume [ped/h]               | 6          |        |        | 5      |        |        | 9      |        |        | 3      |        |        |
| Bicycle Volume [bicycles/h]             | 0          |        |        | 0      |        |        | 0      |        |        | 0      |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | No                              |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 150                             |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fully actuated                  |
| Offset [s]                | 75.0                            |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 12.00                           |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Protecte | Permiss | Unsigna | Protecte | Permiss | Overlap | Split | Split | Split |
|------------------------------|-------|-------|-------|----------|---------|---------|----------|---------|---------|-------|-------|-------|
| Signal group                 | 4     | 4     | 0     | 1        | 6       | 0       | 5        | 2       | 2       | 3     | 3     | 0     |
| Auxiliary Signal Groups      |       |       |       |          |         |         |          |         | 2,4     |       |       |       |
| Lead / Lag                   | Lag   | -     | -     | Lead     | -       | -       | Lead     | -       | -       | Lead  | -     | -     |
| Minimum Green [s]            | 7     | 7     | 0     | 5        | 25      | 0       | 5        | 5       | 5       | 7     | 7     | 0     |
| Maximum Green [s]            | 29    | 29    | 0     | 12       | 46      | 0       | 27       | 61      | 61      | 21    | 21    | 0     |
| Amber [s]                    | 5.0   | 5.0   | 0.0   | 4.0      | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     | 5.0   | 5.0   | 0.0   |
| All red [s]                  | 2.0   | 2.0   | 0.0   | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0   | 2.0   | 0.0   |
| Split [s]                    | 36    | 36    | 0     | 18       | 53      | 0       | 33       | 68      | 68      | 28    | 28    | 0     |
| Vehicle Extension [s]        | 2.5   | 2.5   | 0.0   | 3.0      | 5.0     | 0.0     | 6.0      | 3.0     | 3.0     | 2.5   | 2.5   | 0.0   |
| Walk [s]                     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0        | 0       | 0       | 0        | 0       | 0       | 0     | 0     | 0     |
| Rest In Walk                 |       | No    |       |          | No      |         |          | No      |         |       | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 0.0   | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 2.0     | 2.0   | 2.0   | 0.0   |
| I2, Clearance Lost Time [s]  | 5.0   | 5.0   | 0.0   | 4.0      | 5.0     | 0.0     | 4.0      | 5.0     | 5.0     | 5.0   | 5.0   | 0.0   |
| Minimum Recall               |       | No    |       | No       | No      |         | No       | No      | No      |       | No    |       |
| Maximum Recall               |       | No    |       | No       | Yes     |         | No       | Yes     | Yes     |       | No    |       |
| Pedestrian Recall            |       | No    |       | No       | No      |         | No       | No      | No      |       | No    |       |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0      | 294.0   | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 30.0     | 6.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L      | C      | L     | C     | R    | C      | C      | R      |
|-----------------------------------------|-------|-------|-------|--------|--------|-------|-------|------|--------|--------|--------|
| C, Cycle Length [s]                     | 150   | 150   | 150   | 150    | 150    | 150   | 150   | 150  | 150    | 150    | 150    |
| L, Total Lost Time per Cycle [s]        | 7.00  | 7.00  | 7.00  | 7.00   | 7.00   | 7.00  | 7.00  | 7.00 | 7.00   | 7.00   | 7.00   |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 2.00   | 0.00   | 0.00  | 0.00  | 0.00 | 0.00   | 0.00   | 0.00   |
| l2, Clearance Lost Time [s]             | 5.00  | 5.00  | 5.00  | 0.00   | 5.00   | 0.00  | 5.00  | 0.00 | 5.00   | 5.00   | 5.00   |
| g_i, Effective Green Time [s]           | 29    | 29    | 29    | 79     | 51     | 79    | 61    | 115  | 21     | 21     | 21     |
| g / C, Green / Cycle                    | 0.19  | 0.19  | 0.19  | 0.53   | 0.34   | 0.53  | 0.41  | 0.77 | 0.14   | 0.14   | 0.14   |
| (v / s)_i Volume / Saturation Flow Rate | 0.20  | 0.20  | 0.20  | 0.30   | 0.42   | 0.36  | 0.40  | 0.28 | 0.25   | 0.25   | 0.37   |
| s, saturation flow rate [veh/h]         | 1774  | 1806  | 1640  | 373    | 3547   | 1598  | 3545  | 1578 | 1844   | 1693   | 1551   |
| c, Capacity [veh/h]                     | 343   | 349   | 317   | 96     | 1201   | 707   | 1442  | 1210 | 258    | 237    | 217    |
| d1, Uniform Delay [s]                   | 60.50 | 60.50 | 60.50 | 48.60  | 49.60  | 43.83 | 44.11 | 5.68 | 64.50  | 64.50  | 64.50  |
| k, delay calibration                    | 0.40  | 0.40  | 0.40  | 0.50   | 0.50   | 0.50  | 0.50  | 0.50 | 0.50   | 0.50   | 0.50   |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00  | 1.00  | 1.00 | 1.00   | 1.00   | 1.00   |
| d2, Incremental Delay [s]               | 53.18 | 52.76 | 55.43 | 143.57 | 116.13 | 9.71  | 20.81 | 0.86 | 383.72 | 383.08 | 759.18 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00   | 0.00   | 0.00  | 0.00  | 0.00 | 0.00   | 0.00   | 0.00   |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00  | 1.00  | 1.00 | 1.00   | 1.00   | 1.00   |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00  | 1.00  | 1.00 | 1.00   | 1.00   | 1.00   |

**Lane Group Results**

|                                       |        |        |        |        |         |        |        |        |         |         |         |
|---------------------------------------|--------|--------|--------|--------|---------|--------|--------|--------|---------|---------|---------|
| X, volume / capacity                  | 1.04   | 1.04   | 1.04   | 1.17   | 1.24    | 0.81   | 0.99   | 0.37   | 1.82    | 1.82    | 2.66    |
| d, Delay for Lane Group [s/veh]       | 113.68 | 113.26 | 115.93 | 192.16 | 165.73  | 53.54  | 64.92  | 6.54   | 448.22  | 447.58  | 823.68  |
| Lane Group LOS                        | F      | F      | F      | F      | F       | D      | E      | A      | F       | F       | F       |
| Critical Lane Group                   | No     | No     | Yes    | Yes    | No      | No     | Yes    | No     | No      | No      | Yes     |
| 50th-Percentile Queue Length [veh/ln] | 18.03  | 18.32  | 16.88  | 5.53   | 41.56   | 6.65   | 29.85  | 4.37   | 37.34   | 34.24   | 54.04   |
| 50th-Percentile Queue Length [ft/ln]  | 450.87 | 457.95 | 421.88 | 138.24 | 1038.96 | 166.24 | 746.35 | 109.34 | 933.46  | 856.00  | 1350.94 |
| 95th-Percentile Queue Length [veh/ln] | 25.49  | 25.83  | 24.09  | 9.95   | 59.67   | 10.88  | 38.81  | 7.80   | 57.99   | 53.56   | 84.48   |
| 95th-Percentile Queue Length [ft/ln]  | 637.26 | 645.86 | 602.28 | 248.84 | 1491.80 | 271.96 | 970.37 | 195.08 | 1449.63 | 1339.00 | 2112.08 |



**Movement, Approach, & Intersection Results**

|                                 |        |        |        |        |        |      |       |       |      |        |        |        |
|---------------------------------|--------|--------|--------|--------|--------|------|-------|-------|------|--------|--------|--------|
| d_M, Delay for Movement [s/veh] | 113.51 | 115.04 | 115.93 | 192.16 | 165.73 | 0.00 | 53.54 | 64.92 | 6.54 | 448.22 | 447.88 | 823.68 |
| Movement LOS                    | F      | F      | F      | F      | F      |      | D     | E     | A    | F      | F      | F      |
| d_A, Approach Delay [s/veh]     | 114.24 |        |        | 167.58 |        |      | 51.62 |       |      | 594.71 |        |        |
| Approach LOS                    | F      |        |        | F      |        |      | D     |       |      | F      |        |        |
| d_I, Intersection Delay [s/veh] | 212.09 |        |        |        |        |      |       |       |      |        |        |        |
| Intersection LOS                | F      |        |        |        |        |      |       |       |      |        |        |        |
| Intersection V/C                | 1.199  |        |        |        |        |      |       |       |      |        |        |        |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 25: Ager Rd/23rd Ave

Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutes

Delay (sec / veh): 18.7  
Level Of Service: B  
Volume to Capacity (v/c): 0.432

#### Intersection Setup

| Name                   |                                                                                   |        |        |                                                                                   |        |        | Ager Rd.                                                                            |        |        | Ager Rd.                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 0      | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present           | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                        |        |        |        |        |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|---------------------------------------------|--------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]                   | 14     | 24     | 13     | 199    | 31     | 37     | 21       | 635    | 3      | 25       | 811    | 14     |
| Base Volume Adjustment Factor               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   |
| Growth Rate                                 | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 30     | 0      | 0        | 49     | 0      |
| Diverted Trips [veh/h]                      | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]                 | 14     | 24     | 13     | 199    | 31     | 37     | 21       | 665    | 3      | 25       | 860    | 14     |
| Peak Hour Factor                            | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Other Adjustment Factor                     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 4      | 6      | 3      | 50     | 8      | 9      | 5        | 166    | 1      | 6        | 215    | 4      |
| Total Analysis Volume [veh/h]               | 14     | 24     | 13     | 199    | 31     | 37     | 21       | 665    | 3      | 25       | 860    | 14     |
| Presence of On-Street Parking               | No     |        | No     | No     |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]                 | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | Yes                             |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 0       | 8       | 0       | 0       | 4       | 0       | 0       | 2       | 0       | 0       | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |         |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       | -       |
| Minimum Green [s]            | 0       | 6       | 0       | 0       | 6       | 0       | 0       | 35      | 0       | 0       | 35      | 0       |
| Maximum Green [s]            | 0       | 20      | 0       | 0       | 30      | 0       | 0       | 35      | 0       | 0       | 35      | 0       |
| Amber [s]                    | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     |
| Split [s]                    | 0       | 25      | 0       | 0       | 35      | 0       | 0       | 50      | 0       | 0       | 50      | 0       |
| Vehicle Extension [s]        | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 7       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 21      | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 2.00  | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 0.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 20    | 30    | 45    | 45    | 45    | 45    | 45    | 45    |
| g / C, Green / Cycle                    | 0.22  | 0.33  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| (v / s)_i Volume / Saturation Flow Rate | 0.03  | 0.19  | 0.04  | 0.20  | 0.20  | 0.04  | 0.26  | 0.26  |
| s, saturation flow rate [veh/h]         | 1545  | 1443  | 571   | 1683  | 1680  | 692   | 1683  | 1673  |
| c, Capacity [veh/h]                     | 394   | 516   | 252   | 841   | 840   | 325   | 841   | 837   |
| d1, Uniform Delay [s]                   | 28.11 | 24.44 | 22.78 | 14.04 | 14.04 | 19.49 | 15.21 | 15.21 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.68  | 3.69  | 0.65  | 1.40  | 1.40  | 0.46  | 2.30  | 2.31  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |       |        |        |       |        |        |
|---------------------------------------|-------|--------|-------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.13  | 0.52   | 0.08  | 0.40   | 0.40   | 0.08  | 0.52   | 0.52   |
| d, Delay for Lane Group [s/veh]       | 28.79 | 28.13  | 23.43 | 15.44  | 15.44  | 19.95 | 17.51  | 17.52  |
| Lane Group LOS                        | C     | C      | C     | B      | B      | B     | B      | B      |
| Critical Lane Group                   | No    | Yes    | No    | No     | No     | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 0.95  | 4.95   | 0.36  | 4.24   | 4.24   | 0.38  | 6.10   | 6.07   |
| 50th-Percentile Queue Length [ft/ln]  | 23.66 | 123.84 | 8.95  | 106.09 | 105.96 | 9.50  | 152.52 | 151.74 |
| 95th-Percentile Queue Length [veh/ln] | 1.70  | 8.60   | 0.64  | 7.62   | 7.61   | 0.68  | 10.15  | 10.11  |
| 95th-Percentile Queue Length [ft/ln]  | 42.58 | 215.09 | 16.12 | 190.56 | 190.37 | 17.10 | 253.79 | 252.75 |

**Movement, Approach, & Intersection Results**

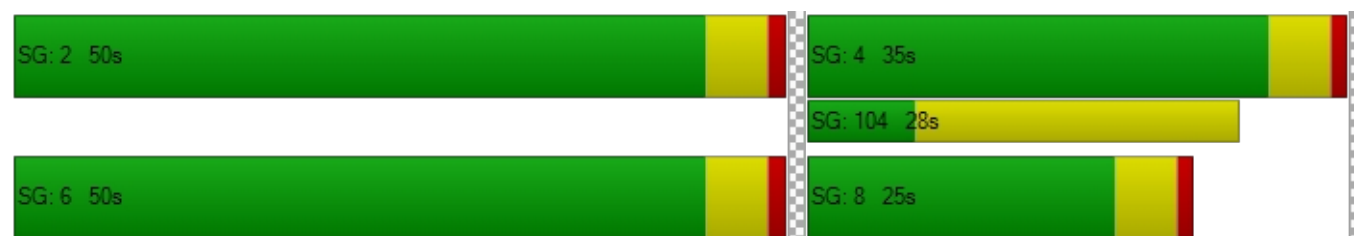
|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 28.79 | 28.79 | 28.79 | 28.13 | 28.13 | 28.13 | 23.43 | 15.44 | 15.44 | 19.95 | 17.52 | 17.52 |
| Movement LOS                    | C     | C     | C     | C     | C     | C     | C     | B     | B     | B     | B     | B     |
| d_A, Approach Delay [s/veh]     | 28.79 |       |       | 28.13 |       |       | 15.69 |       |       | 17.59 |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | B     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 18.68 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.432 |       |       |       |       |       |       |       |       |       |       |       |

**Other Modes**

|                                                          |       |       |       |       |
|----------------------------------------------------------|-------|-------|-------|-------|
| g_Walk,mi, Effective Walk Time [s]                       | 45.0  | 45.0  | 20.0  | 11.0  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  | 0.00  | 0.00  | 0.00  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  | 0.00  | 0.00  | 0.00  |
| d_p, Pedestrian Delay [s]                                | 11.25 | 11.25 | 27.22 | 34.67 |
| I_p,int, Pedestrian LOS Score for Intersection           | 1.756 | 1.860 | 3.019 | 2.687 |
| Crosswalk LOS                                            | A     | A     | C     | B     |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  | 2000  | 2000  | 2000  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 444   | 667   | 1000  | 1000  |
| d_b, Bicycle Delay [s]                                   | 27.22 | 20.00 | 11.25 | 11.25 |
| I_b,int, Bicycle LOS Score for Intersection              | 1.644 | 2.000 | 2.128 | 2.301 |
| Bicycle LOS                                              | A     | B     | B     | B     |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 26: Ager Rd/Oglethorpe St/School

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 47.2  |
| Analysis Method: | HCM 6th Edition | Level Of Service:         | D     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.394 |

#### Intersection Setup

| Name                   |                                                                                   |        |        |                                                                                   |        |        | Ager Rd.                                                                            |        |         | Ager Rd.                                                                            |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|---------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |        |         | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |         |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right   | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00   | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0      | 1       | 1                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 200.00                                                                              | 100.00 | 1200.00 | 350.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 35.00                                                                               |        |         | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |         | 0.00                                                                                |        |        |
| Curb Present           | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |         | No                                                                                  |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |         | Yes                                                                                 |        |        |

#### Volumes

| Name                                        |        |        |        |        |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|---------------------------------------------|--------|--------|--------|--------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]                   | 21     | 0      | 32     | 2      | 0      | 0      | 51       | 981    | 2      | 3        | 1040   | 35     |
| Base Volume Adjustment Factor               | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   |
| Growth Rate                                 | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]                   | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 30     | 0      | 0        | 49     | 0      |
| Diverted Trips [veh/h]                      | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]            | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]                 | 21     | 0      | 32     | 2      | 0      | 0      | 51       | 1011   | 2      | 3        | 1089   | 35     |
| Peak Hour Factor                            | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Other Adjustment Factor                     | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 5      | 0      | 8      | 1      | 0      | 0      | 13       | 253    | 1      | 1        | 272    | 9      |
| Total Analysis Volume [veh/h]               | 21     | 0      | 32     | 2      | 0      | 0      | 51       | 1011   | 2      | 3        | 1089   | 35     |
| Presence of On-Street Parking               | No     |        | No     | No     |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0      | 0      | 0      | 0      | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]                 | 0      |        |        | 0      |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                                 |
|---------------------------|---------------------------------|
| Located in CBD            | Yes                             |
| Signal Coordination Group | -                               |
| Cycle Length [s]          | 90                              |
| Coordination Type         | Time of Day Pattern Coordinated |
| Actuation Type            | Fixed time                      |
| Offset [s]                | 0.0                             |
| Offset Reference          | LeadGreen                       |
| Permissive Mode           | SingleBand                      |
| Lost time [s]             | 0.00                            |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal group                 | 0       | 4       | 0       | 0       | 8       | 0       | 5        | 2       | 0       | 1        | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |          |         |         |          |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | Lead     | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 0       | 5       | 0       | 5        | 10      | 0       | 5        | 10      | 0       |
| Maximum Green [s]            | 0       | 20      | 0       | 0       | 20      | 0       | 20       | 30      | 0       | 20       | 30      | 0       |
| Amber [s]                    | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     | 4.0      | 4.0     | 0.0     | 4.0      | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     |
| Split [s]                    | 0       | 30      | 0       | 0       | 30      | 0       | 30       | 45      | 0       | 30       | 45      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 6.0     | 0.0     | 3.0      | 6.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 27      | 0       | 0        | 11      | 0       | 0        | 12      | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Maximum Recall               |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         | No       | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | L     | C     | C     | L     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 109   | 109   | 109   | 109   | 109   | 109   | 109   | 109   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 0.00  | 3.00  | 3.00  | 0.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 25    | 25    | 70    | 40    | 40    | 70    | 40    | 40    |
| g / C, Green / Cycle                    | 0.23  | 0.23  | 0.64  | 0.37  | 0.37  | 0.64  | 0.37  | 0.37  |
| (v / s)_i Volume / Saturation Flow Rate | 0.04  | 0.00  | 0.06  | 0.30  | 0.30  | 0.00  | 0.34  | 0.34  |
| s, saturation flow rate [veh/h]         | 1384  | 1255  | 912   | 1683  | 1682  | 942   | 1683  | 1665  |
| c, Capacity [veh/h]                     | 363   | 354   | 537   | 618   | 617   | 564   | 618   | 611   |
| d1, Uniform Delay [s]                   | 33.54 | 32.42 | 13.50 | 31.25 | 31.25 | 11.07 | 32.88 | 32.88 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.84  | 0.03  | 0.35  | 11.64 | 11.64 | 0.02  | 20.42 | 20.62 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |       |       |        |        |       |        |        |
|---------------------------------------|-------|-------|-------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.15  | 0.01  | 0.10  | 0.82   | 0.82   | 0.01  | 0.91   | 0.92   |
| d, Delay for Lane Group [s/veh]       | 34.38 | 32.45 | 13.85 | 42.88  | 42.89  | 11.08 | 53.30  | 53.51  |
| Lane Group LOS                        | C     | C     | B     | D      | D      | B     | D      | D      |
| Critical Lane Group                   | Yes   | No    | Yes   | No     | No     | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 1.21  | 0.04  | 0.46  | 13.64  | 13.63  | 0.03  | 17.16  | 17.01  |
| 50th-Percentile Queue Length [ft/ln]  | 30.20 | 1.10  | 11.48 | 340.89 | 340.69 | 0.65  | 429.01 | 425.31 |
| 95th-Percentile Queue Length [veh/ln] | 2.17  | 0.08  | 0.83  | 19.69  | 19.68  | 0.05  | 23.95  | 23.78  |
| 95th-Percentile Queue Length [ft/ln]  | 54.36 | 1.97  | 20.67 | 492.29 | 492.04 | 1.16  | 598.85 | 594.42 |



**Movement, Approach, & Intersection Results**

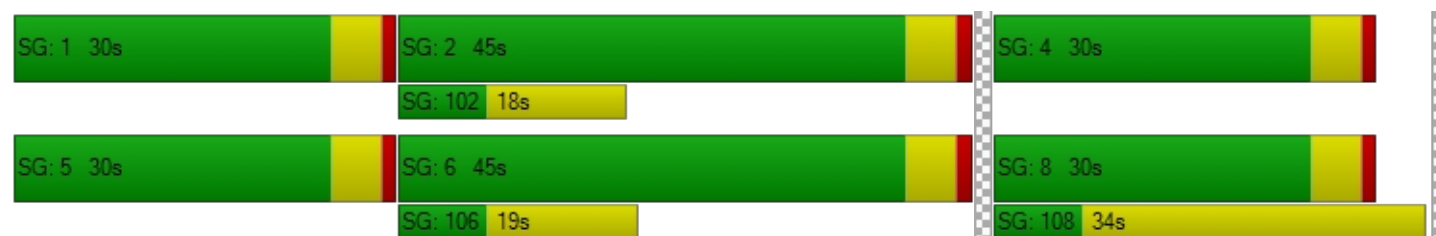
|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 34.38 | 34.38 | 34.38 | 32.45 | 32.45 | 32.45 | 13.85 | 42.89 | 42.89 | 11.08 | 53.40 | 53.51 |
| Movement LOS                    | C     | C     | C     | C     | C     | C     | B     | D     | D     | B     | D     | D     |
| d_A, Approach Delay [s/veh]     | 34.38 |       |       | 32.45 |       |       | 41.49 |       |       | 53.29 |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 47.24 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.394 |       |       |       |       |       |       |       |       |       |       |       |

**Other Modes**

|                                                          |       |       |       |       |
|----------------------------------------------------------|-------|-------|-------|-------|
| g_Walk,mi, Effective Walk Time [s]                       | 11.0  | 11.0  | 25.0  | 11.0  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  | 0.00  | 0.00  | 0.00  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  | 0.00  | 0.00  | 0.00  |
| d_p, Pedestrian Delay [s]                                | 34.67 | 34.67 | 23.47 | 34.67 |
| I_p,int, Pedestrian LOS Score for Intersection           | 1.810 | 1.719 | 2.784 | 2.820 |
| Crosswalk LOS                                            | A     | A     | C     | C     |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  | 2000  | 2000  | 2000  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 556   | 556   | 889   | 889   |
| d_b, Bicycle Delay [s]                                   | 23.47 | 23.47 | 13.89 | 13.89 |
| I_b,int, Bicycle LOS Score for Intersection              | 1.647 | 1.563 | 2.437 | 2.489 |
| Bicycle LOS                                              | A     | A     | B     | B     |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 27: Ager Rd/Nicholson St

Control Type: Two-way stop  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 10,000.0  
Level Of Service: F  
Volume to Capacity (v/c): 0.721

#### Intersection Setup

| Name                   | Ager Rd                                                                           |       |       |       | Nicholson St                                                                      |        |        | Nicholson St                                                                        |        |        | Ager Rd.                                                                            |       |       |       |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|
| Approach               | Northbound                                                                        |       |       |       | Northeastbound                                                                    |        |        | Southwestbound                                                                      |        |        | Southeastbound                                                                      |       |       |       |
| Lane Configuration     |  |       |       |       |  |        |        |  |        |        |  |       |       |       |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 1     | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 1                                                                                   | 0     | 0     | 0     |
| Pocket Length [ft]     | 225.0                                                                             | 100.0 | 100.0 | 150.0 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 200.0                                                                               | 100.0 | 100.0 | 100.0 |
| Speed [mph]            | 35.00                                                                             |       |       |       | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 35.00                                                                               |       |       |       |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |       |       |       |
| Crosswalk              | Yes                                                                               |       |       |       | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |       |       |       |

#### Volumes

| Name                                    | Ager Rd |       |       |       | Nicholson St |        |        | Nicholson St |        |        | Ager Rd. |       |       |       |
|-----------------------------------------|---------|-------|-------|-------|--------------|--------|--------|--------------|--------|--------|----------|-------|-------|-------|
| Base Volume Input [veh/h]               | 1       | 78    | 838   | 96    | 69           | 14     | 70     | 25           | 10     | 107    | 6        | 175   | 742   | 93    |
| Base Volume Adjustment Factor           | 1.000   | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000    | 1.000 | 1.000 | 1.000 |
| Heavy Vehicles Percentage [%]           | 0.00    | 0.00  | 2.00  | 0.00  | 2.00         | 0.00   | 1.82   | 0.00         | 0.00   | 1.74   | 0.00     | 2.44  | 2.00  | 3.57  |
| Growth Rate                             | 1.00    | 1.00  | 1.00  | 1.00  | 1.00         | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00     | 1.00  | 1.00  | 1.00  |
| In-Process Volume [veh/h]               | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Site-Generated Trips [veh/h]            | 0       | 0     | 30    | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 49    | 0     |
| Diverted Trips [veh/h]                  | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Pass-by Trips [veh/h]                   | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Existing Site Adjustment Volume [veh/h] | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Other Volume [veh/h]                    | 0       | 0     | 0     | 0     | 0            | 0      | 0      | 0            | 0      | 0      | 0        | 0     | 0     | 0     |
| Total Hourly Volume [veh/h]             | 1       | 78    | 868   | 96    | 69           | 14     | 70     | 25           | 10     | 107    | 6        | 175   | 791   | 93    |
| Peak Hour Factor                        | 0.900   | 0.900 | 0.900 | 0.900 | 0.9000       | 0.9000 | 0.9000 | 0.9000       | 0.9000 | 0.9000 | 0.900    | 0.900 | 0.900 | 0.900 |
| Other Adjustment Factor                 | 1.000   | 1.000 | 1.000 | 1.000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000    | 1.000 | 1.000 | 1.000 |
| Total 15-Minute Volume [veh/h]          | 0       | 22    | 241   | 27    | 19           | 4      | 19     | 7            | 3      | 30     | 2        | 49    | 220   | 26    |
| Total Analysis Volume [veh/h]           | 1       | 87    | 964   | 107   | 77           | 16     | 78     | 28           | 11     | 119    | 7        | 194   | 879   | 103   |
| Pedestrian Volume [ped/h]               | 0       |       |       |       | 0            |        |        | 0            |        |        | 0        |       |       |       |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Stop | Stop | Free |
| Flared Lane                        |      | No   | No   |      |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      | No   | No   |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |        |       |      |      |         |         |         |          |         |         |       |       |      |      |
|---------------------------------------|--------|-------|------|------|---------|---------|---------|----------|---------|---------|-------|-------|------|------|
| V/C, Movement V/C Ratio               | 0.00   | 0.12  | 0.01 | 0.00 | 9.63    | 1.05    | 0.15    | 0.00     | 0.72    | 0.24    | 0.04  | 0.30  | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 21.90  | 10.81 | 0.00 | 0.00 | 5115.45 | 4902.15 | 4672.28 | 10000.0  | 10000.0 | 10000.0 | 28.97 | 13.74 | 0.00 | 0.00 |
| Movement LOS                          | C      | B     | A    | A    | F       | F       | F       | F        | F       | F       | D     | B     | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.00   | 0.00  | 0.00 | 0.00 | 22.28   | 22.28   | 22.28   | 22.40    | 22.40   | 22.40   | 0.03  | 0.03  | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 0.11   | 0.11  | 0.00 | 0.00 | 556.98  | 556.98  | 556.98  | 559.89   | 559.89  | 559.89  | 0.77  | 0.77  | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 0.83   |       |      |      | 4893.34 |         |         | 10000.00 |         |         | 2.42  |       |      |      |
| Approach LOS                          | A      |       |      |      | F       |         |         | F        |         |         | A     |       |      |      |
| d_I, Intersection Delay [s/veh]       | 906.25 |       |      |      |         |         |         |          |         |         |       |       |      |      |
| Intersection LOS                      | F      |       |      |      |         |         |         |          |         |         |       |       |      |      |

### Intersection Level Of Service Report

#### Intersection 28: Ager Rd/Hamilton St

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 25.5  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.821

#### Intersection Setup

| Name                   | Hamilton St                                                                       |        |        | Hamilton St                                                                       |        |        | Ager Rd.                                                                            |        |        | Ager Rd.                                                                            |        |         |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|---------|
| Approach               | Eastbound                                                                         |        |        | Westbound                                                                         |        |        | Northwestbound                                                                      |        |        | Southeastbound                                                                      |        |         |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |         |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right   |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00   |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 1                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1       |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 1500.00 |
| Speed [mph]            | 35.00                                                                             |        |        | 35.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |         |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |         |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |         |

#### Volumes

| Name                                    | Hamilton St |        |        | Hamilton St |        |        | Ager Rd. |        |        | Ager Rd. |        |        |
|-----------------------------------------|-------------|--------|--------|-------------|--------|--------|----------|--------|--------|----------|--------|--------|
| Base Volume Input [veh/h]               | 65          | 158    | 16     | 130         | 83     | 488    | 28       | 388    | 125    | 454      | 290    | 50     |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 3.33        | 1.72   | 0.00   | 3.85        | 2.08   | 1.91   | 2.06     | 1.84   | 3.33   | 2.21     | 2.00   | 2.63   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Site-Generated Trips [veh/h]            | 30          | 51     | 37     | 0           | 84     | 0      | 61       | 0      | 0      | 0        | 0      | 49     |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Total Hourly Volume [veh/h]             | 95          | 209    | 53     | 130         | 167    | 488    | 89       | 388    | 125    | 454      | 290    | 99     |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 26          | 58     | 15     | 36          | 46     | 136    | 25       | 108    | 35     | 126      | 81     | 28     |
| Total Analysis Volume [veh/h]           | 106         | 232    | 59     | 144         | 186    | 542    | 99       | 431    | 139    | 504      | 322    | 110    |
| Presence of On-Street Parking           | No          |        | No     | No          |        | No     | No       |        | No     | No       |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0           | 0      | 0      | 0        | 0      | 0      | 0        | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0           |        |        | 0        |        |        | 0        |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0           |        |        | 0        |        |        | 0        |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 80                           |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal group                 | 0       | 8       | 0       | 0       | 4       | 0       | 0       | 2       | 0       | 1        | 6       | 0       |
| Auxiliary Signal Groups      |         |         |         |         |         |         |         |         |         |          |         |         |
| Lead / Lag                   | -       | -       | -       | -       | -       | -       | -       | -       | -       | Lead     | -       | -       |
| Minimum Green [s]            | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 10      | 0       | 5        | 10      | 0       |
| Maximum Green [s]            | 0       | 26      | 0       | 0       | 26      | 0       | 0       | 30      | 0       | 10       | 45      | 0       |
| Amber [s]                    | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                  | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 0.0     | 1.0     | 0.0     | 1.0      | 1.0     | 0.0     |
| Split [s]                    | 0       | 30      | 0       | 0       | 30      | 0       | 0       | 35      | 0       | 15       | 50      | 0       |
| Vehicle Extension [s]        | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     | 3.0      | 3.0     | 0.0     |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       | 0       |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]   | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]  | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 3.0     | 0.0     | 2.0      | 3.0     | 0.0     |
| Minimum Recall               |         | No      |         |         | No      |         |         | Yes     |         | Yes      | Yes     |         |
| Maximum Recall               |         | No      |         |         | No      |         |         | No      |         | No       | No      |         |
| Pedestrian Recall            |         | No      |         |         | No      |         |         | No      |         | No       | No      |         |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | C     | C     | C     | C     | R     | L     | C     | C     | L     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 73    | 73    | 73    | 73    | 73    | 73    | 73    | 73    | 73    | 73    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  | 3.00  | 3.00  | 3.00  | 0.00  | 3.00  |
| g_i, Effective Green Time [s]           | 26    | 26    | 26    | 26    | 26    | 24    | 24    | 24    | 38    | 38    |
| g / C, Green / Cycle                    | 0.36  | 0.36  | 0.36  | 0.36  | 0.36  | 0.33  | 0.33  | 0.33  | 0.52  | 0.52  |
| (v / s)_i Volume / Saturation Flow Rate | 0.16  | 0.14  | 0.21  | 0.11  | 0.34  | 0.10  | 0.16  | 0.16  | 0.44  | 0.24  |
| s, saturation flow rate [veh/h]         | 1033  | 1628  | 672   | 1694  | 1585  | 952   | 1866  | 1712  | 1134  | 1783  |
| c, Capacity [veh/h]                     | 451   | 581   | 339   | 605   | 566   | 234   | 608   | 558   | 626   | 925   |
| d1, Uniform Delay [s]                   | 20.83 | 17.54 | 25.36 | 16.85 | 22.80 | 29.86 | 19.60 | 19.63 | 14.95 | 11.09 |
| k, delay calibration                    | 0.11  | 0.11  | 0.15  | 0.11  | 0.41  | 0.11  | 0.11  | 0.11  | 0.50  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.48  | 0.45  | 1.18  | 0.29  | 25.33 | 1.22  | 0.60  | 0.67  | 10.58 | 0.37  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |       |       |        |       |        |        |        |        |
|---------------------------------------|-------|--------|-------|-------|--------|-------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.36  | 0.41   | 0.42  | 0.31  | 0.96   | 0.42  | 0.49   | 0.49   | 0.80   | 0.47   |
| d, Delay for Lane Group [s/veh]       | 21.31 | 17.99  | 26.55 | 17.13 | 48.12  | 31.08 | 20.21  | 20.30  | 25.53  | 11.46  |
| Lane Group LOS                        | C     | B      | C     | B     | D      | C     | C      | C      | C      | B      |
| Critical Lane Group                   | No    | No     | No    | No    | Yes    | No    | No     | Yes    | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 2.19  | 2.79   | 2.21  | 2.11  | 12.12  | 1.65  | 3.79   | 3.53   | 6.49   | 3.86   |
| 50th-Percentile Queue Length [ft/ln]  | 54.75 | 69.86  | 55.15 | 52.80 | 303.01 | 41.23 | 94.86  | 88.13  | 162.32 | 96.48  |
| 95th-Percentile Queue Length [veh/ln] | 3.94  | 5.03   | 3.97  | 3.80  | 17.83  | 2.97  | 6.83   | 6.35   | 10.67  | 6.95   |
| 95th-Percentile Queue Length [ft/ln]  | 98.55 | 125.75 | 99.27 | 95.05 | 445.75 | 74.22 | 170.75 | 158.63 | 266.79 | 173.67 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 21.31 | 18.79 | 17.99 | 26.55 | 17.13 | 48.12 | 31.08 | 20.24 | 20.30 | 25.53 | 11.46 | 11.46 |
| Movement LOS                    | C     | B     | B     | C     | B     | D     | C     | C     | C     | C     | B     | B     |
| d_A, Approach Delay [s/veh]     | 19.34 |       |       | 37.95 |       |       | 21.85 |       |       | 19.04 |       |       |
| Approach LOS                    | B     |       |       | D     |       |       | C     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 25.47 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.821 |       |       |       |       |       |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 29: Toledo Rd/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 15.2  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.549

#### Intersection Setup

| Name                   | Belcrest Rd                                                                       |       |       |       | Belcrest Rd                                                                       |       |       |       | Toledo Rd                                                                           |        |        | Toledo Rd                                                                           |        |        |
|------------------------|-----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |       |       |       | Southbound                                                                        |       |       |       | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |       |       |       |  |       |       |       |  |        |        |  |        |        |
| Turning Movement       | U-tu                                                                              | Left  | Thru  | Right | U-tu                                                                              | Left  | Thru  | Right | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                             | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0     | 0     | 0     | 1                                                                                 | 0     | 0     | 0     | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 400.0                                                                             | 100.0 | 100.0 | 100.0 | 200.0                                                                             | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |       |       |       | 30.00                                                                             |       |       |       | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |       |       |       | 0.00                                                                              |       |       |       | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |       |       |       | No                                                                                |       |       |       | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Rd |       |       |       | Belcrest Rd |       |       |       | Toledo Rd |        |        | Toledo Rd |        |        |
|-----------------------------------------|-------------|-------|-------|-------|-------------|-------|-------|-------|-----------|--------|--------|-----------|--------|--------|
| Base Volume Input [veh/h]               | 15          | 192   | 383   | 78    | 2           | 93    | 444   | 144   | 157       | 69     | 179    | 56        | 80     | 87     |
| Base Volume Adjustment Factor           | 1.000       | 1.000 | 1.000 | 1.000 | 1.000       | 1.000 | 1.000 | 1.000 | 1.0000    | 1.0000 | 1.0000 | 1.0000    | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00        | 3.03  | 1.83  | 1.37  | 0.00        | 2.00  | 2.02  | 0.00  | 0.00      | 2.86   | 0.00   | 2.86      | 3.45   | 2.13   |
| Growth Rate                             | 1.00        | 1.00  | 1.00  | 1.00  | 1.00        | 1.00  | 1.00  | 1.00  | 1.00      | 1.00   | 1.00   | 1.00      | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 0     | 8     | 0     | 0           | 0     | 10    | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Total Hourly Volume [veh/h]             | 15          | 192   | 391   | 78    | 2           | 93    | 454   | 144   | 157       | 69     | 179    | 56        | 80     | 87     |
| Peak Hour Factor                        | 0.900       | 0.900 | 0.900 | 0.900 | 0.900       | 0.900 | 0.900 | 0.900 | 0.9000    | 0.9000 | 0.9000 | 0.9000    | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.000       | 1.000 | 1.000 | 1.000 | 1.000       | 1.000 | 1.000 | 1.000 | 1.0000    | 1.0000 | 1.0000 | 1.0000    | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4           | 53    | 109   | 22    | 1           | 26    | 126   | 40    | 44        | 19     | 50     | 16        | 22     | 24     |
| Total Analysis Volume [veh/h]           | 17          | 213   | 434   | 87    | 2           | 103   | 504   | 160   | 174       | 77     | 199    | 62        | 89     | 97     |
| Presence of On-Street Parking           | No          |       |       | No    | No          |       |       | No    | No        |        | No     | No        |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0     | 0     | 0     | 0           | 0     | 0     | 0     | 0         | 0      | 0      | 0         | 0      | 0      |
| Pedestrian Volume [ped/h]               | 8           |       |       |       | 0           |       |       |       | 20        |        |        | 15        |        |        |
| Bicycle Volume [bicycles/h]             | 0           |       |       |       | 0           |       |       |       | 0         |        |        | 0         |        |        |



**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 80             |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 0.0            |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 12.00          |

**Phasing & Timing**

| Control Type                 | Permi | Permi | Permi | Permi | Permi | Permi | Permi | Permi | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|
| Signal group                 | 2     | 2     | 2     | 2     | 6     | 6     | 6     | 6     | 4       | 4       | 4       | 8       | 8       | 8       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |         |         |         |         |         |         |
| Lead / Lag                   | Lag   | Lag   | -     | -     | Lag   | Lag   | -     | -     | Lag     | -       | -       | Lag     | -       | -       |
| Minimum Green [s]            | 4     | 4     | 4     | 4     | 4     | 4     | 4     | 4     | 4       | 4       | 4       | 4       | 4       | 4       |
| Maximum Green [s]            | 40    | 40    | 40    | 40    | 40    | 40    | 40    | 40    | 30      | 30      | 30      | 30      | 30      | 30      |
| Amber [s]                    | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     |
| All red [s]                  | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     | 1.0     |
| Split [s]                    | 30    | 30    | 30    | 30    | 30    | 30    | 30    | 30    | 30      | 30      | 30      | 30      | 30      | 30      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Walk [s]                     | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7       | 7       | 7       | 7       | 7       | 7       |
| Pedestrian Clearance [s]     | 15    | 15    | 15    | 15    | 15    | 15    | 15    | 15    | 21      | 21      | 21      | 21      | 21      | 21      |
| Rest In Walk                 |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     | 3.0     |
| Minimum Recall               |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| Maximum Recall               |       |       | Yes   |       |       |       | Yes   |       |         | No      |         |         | No      |         |
| Pedestrian Recall            |       |       | No    |       |       |       | No    |       |         | No      |         |         | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 30.0  | 30.0  | 30.0  | 30.0  | 0.0   | 0.0   | 0.0   | 0.0   | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | C    | L     | C    | C    | L     | C     | R     | C     |
|-----------------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 72    | 72   | 72   | 72    | 72   | 72   | 72    | 72    | 72    | 72    |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00 | 5.00 | 5.00  | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 2.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00 | 3.00 | 3.00  | 3.00 | 3.00 | 3.00  | 3.00  | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 40    | 40   | 40   | 40    | 40   | 40   | 22    | 22    | 22    | 22    |
| g / C, Green / Cycle                    | 0.55  | 0.55 | 0.55 | 0.55  | 0.55 | 0.55 | 0.31  | 0.31  | 0.31  | 0.31  |
| (v / s)_i Volume / Saturation Flow Rate | 0.30  | 0.14 | 0.14 | 0.12  | 0.19 | 0.19 | 0.14  | 0.04  | 0.12  | 0.15  |
| s, saturation flow rate [veh/h]         | 760   | 1866 | 1750 | 874   | 1862 | 1694 | 1217  | 1847  | 1602  | 1603  |
| c, Capacity [veh/h]                     | 414   | 1032 | 968  | 487   | 1031 | 937  | 328   | 570   | 494   | 557   |
| d1, Uniform Delay [s]                   | 17.81 | 8.42 | 8.43 | 12.72 | 8.85 | 8.88 | 27.85 | 18.04 | 19.74 | 20.24 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50 | 0.50 | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 5.30  | 0.61 | 0.66 | 1.01  | 0.88 | 0.99 | 1.34  | 0.11  | 0.53  | 0.56  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |       |       |       |        |        |        |       |        |        |
|---------------------------------------|--------|-------|-------|-------|--------|--------|--------|-------|--------|--------|
| X, volume / capacity                  | 0.56   | 0.26  | 0.26  | 0.22  | 0.34   | 0.34   | 0.53   | 0.14  | 0.40   | 0.45   |
| d, Delay for Lane Group [s/veh]       | 23.11  | 9.03  | 9.09  | 13.74 | 9.73   | 9.87   | 29.19  | 18.15 | 20.27  | 20.80  |
| Lane Group LOS                        | C      | A     | A     | B     | A      | A      | C      | B     | C      | C      |
| Critical Lane Group                   | Yes    | No    | No    | No    | No     | No     | No     | No    | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 3.54   | 2.08  | 1.98  | 1.13  | 2.83   | 2.64   | 2.85   | 0.90  | 2.57   | 3.28   |
| 50th-Percentile Queue Length [ft/ln]  | 88.47  | 51.89 | 49.42 | 28.14 | 70.76  | 66.03  | 71.23  | 22.53 | 64.33  | 82.09  |
| 95th-Percentile Queue Length [veh/ln] | 6.37   | 3.74  | 3.56  | 2.03  | 5.09   | 4.75   | 5.13   | 1.62  | 4.63   | 5.91   |
| 95th-Percentile Queue Length [ft/ln]  | 159.24 | 93.40 | 88.95 | 50.66 | 127.37 | 118.86 | 128.22 | 40.55 | 115.79 | 147.77 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |      |       |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|-------|------|------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 23.11 | 23.11 | 9.05 | 9.09 | 13.74 | 13.74 | 9.77 | 9.87 | 29.19 | 18.15 | 20.27 | 20.80 | 20.80 | 20.80 |
| Movement LOS                    | C     | C     | A    | A    | B     | B     | A    | A    | C     | B     | C     | C     | C     | C     |
| d_A, Approach Delay [s/veh]     | 13.36 |       |      |      | 10.33 |       |      |      | 23.36 |       |       | 20.80 |       |       |
| Approach LOS                    | B     |       |      |      | B     |       |      |      | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 15.17 |       |      |      |       |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | B     |       |      |      |       |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.549 |       |      |      |       |       |      |      |       |       |       |       |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

SG: 2 45s

SG: 4 35s

SG: 102 22s

SG: 104 28s

SG: 6 45s

SG: 8 35s

SG: 106 22s

### Intersection Level Of Service Report

#### Intersection 30: Adelphi Rd/Belcrest Rd

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 35.2  
 Level Of Service: D  
 Volume to Capacity (v/c): 0.873

#### Intersection Setup

| Name                   | Belcrest Rd                                                                       |        |        | Underwood St                                                                      |        |        | Adelphi Rd                                                                          |       |       |       | Adelphi Rd                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northeastbound                                                                    |        |        | Southwestbound                                                                    |        |        | Northwestbound                                                                      |       |       |       | Southeastbound                                                                      |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |       |       |       |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | U-tu                                                                                | Left  | Thru  | Right | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00 | 12.00 | 12.00 | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 1                                                                                   | 0     | 0     | 0     | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 150.0                                                                               | 100.0 | 100.0 | 100.0 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |       |       |       | 30.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |       |       |       | 0.00                                                                                |        |        |
| Crosswalk              | No                                                                                |        |        | Yes                                                                               |        |        | Yes                                                                                 |       |       |       | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Belcrest Rd |        |        | Underwood St |        |        | Adelphi Rd |       |       |       | Adelphi Rd |        |        |
|-----------------------------------------|-------------|--------|--------|--------------|--------|--------|------------|-------|-------|-------|------------|--------|--------|
| Base Volume Input [veh/h]               | 693         | 0      | 68     | 10           | 8      | 1      | 2          | 17    | 1150  | 0     | 0          | 819    | 650    |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000      | 1.000 | 1.000 | 1.000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.12        | 0.00   | 0.00   | 0.00         | 0.00   | 0.00   | 0.00       | 0.00  | 1.98  | 0.00  | 0.00       | 1.99   | 1.94   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00         | 1.00   | 1.00   | 1.00       | 1.00  | 1.00  | 1.00  | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 8           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 7     | 0     | 0          | 18     | 10     |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 701         | 0      | 68     | 10           | 8      | 1      | 2          | 17    | 1157  | 0     | 0          | 837    | 660    |
| Peak Hour Factor                        | 0.9000      | 1.0000 | 1.0000 | 0.9000       | 0.9000 | 0.9000 | 0.900      | 0.900 | 0.900 | 1.000 | 1.0000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.000      | 1.000 | 1.000 | 1.000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 195         | 0      | 17     | 3            | 2      | 0      | 1          | 5     | 321   | 0     | 0          | 233    | 183    |
| Total Analysis Volume [veh/h]           | 779         | 0      | 68     | 11           | 9      | 1      | 2          | 19    | 1286  | 0     | 0          | 930    | 733    |
| Presence of On-Street Parking           | No          |        | No     | No           |        | No     | No         |       |       | No    | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0            | 0      | 0      | 0          | 0     | 0     | 0     | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0            |        |        | 1          |       |       |       | 5          |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0            |        |        | 0          |       |       |       | 0          |        |        |

**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 122                          |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Split | Split | Split | Split | Split | Split | Permi | Prote | Permi | Permi | Permiss | Permiss | Permiss |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|
| Signal group                 | 4     | 4     | 0     | 8     | 8     | 8     | 5     | 5     | 2     | 0     | 0       | 6       | 6       |
| Auxiliary Signal Groups      |       |       |       |       |       |       |       |       |       |       |         |         |         |
| Lead / Lag                   | Lead  | -     | -     | Lag   | -     | -     | Lead  | Lead  | -     | -     | -       | -       | -       |
| Minimum Green [s]            | 4     | 4     | 0     | 4     | 4     | 4     | 4     | 4     | 4     | 0     | 0       | 4       | 4       |
| Maximum Green [s]            | 30    | 30    | 0     | 17    | 17    | 17    | 11    | 11    | 60    | 0     | 0       | 46      | 46      |
| Amber [s]                    | 4.0   | 4.0   | 0.0   | 4.0   | 4.0   | 4.0   | 3.5   | 3.5   | 4.0   | 0.0   | 0.0     | 3.0     | 3.0     |
| All red [s]                  | 1.0   | 1.0   | 0.0   | 1.0   | 1.0   | 1.0   | 0.5   | 0.5   | 1.0   | 0.0   | 0.0     | 1.0     | 1.0     |
| Split [s]                    | 35    | 35    | 0     | 22    | 22    | 22    | 15    | 15    | 65    | 0     | 0       | 50      | 50      |
| Vehicle Extension [s]        | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 0.0     | 3.0     | 3.0     |
| Walk [s]                     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0       | 0       | 0       |
| Pedestrian Clearance [s]     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0       | 0       | 0       |
| Rest In Walk                 | No    |       |       |       | No    |       |       |       | No    |       |         | No      |         |
| I1, Start-Up Lost Time [s]   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | 0.0   | 0.0     | 2.0     | 2.0     |
| I2, Clearance Lost Time [s]  | 3.0   | 3.0   | 0.0   | 3.0   | 3.0   | 3.0   | 2.0   | 2.0   | 3.0   | 0.0   | 0.0     | 2.0     | 2.0     |
| Minimum Recall               | No    |       |       |       | No    |       |       | No    | No    |       |         | No      |         |
| Maximum Recall               | No    |       |       |       | No    |       |       | No    | Yes   |       |         | Yes     |         |
| Pedestrian Recall            | No    |       |       |       | No    |       |       | No    | No    |       |         | No      |         |
| Detector Location [ft]       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]         | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 30.0  | 30.0  | 30.0  | 0.0   | 0.0     | 30.0    | 30.0    |
| I, Upstream Filtering Factor | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00    | 1.00    |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | C     | L     | C     | C     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| C, Cycle Length [s]                     | 104   | 104   | 104   | 104   | 104   | 104   | 104   |
| L, Total Lost Time per Cycle [s]        | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 4.00  | 4.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 3.00  | 3.00  | 3.00  | 0.00  | 3.00  | 2.00  | 2.00  |
| g_i, Effective Green Time [s]           | 27    | 27    | 2     | 60    | 60    | 55    | 55    |
| g / C, Green / Cycle                    | 0.26  | 0.26  | 0.02  | 0.58  | 0.58  | 0.53  | 0.53  |
| (v / s)_i Volume / Saturation Flow Rate | 0.24  | 0.24  | 0.01  | 0.05  | 0.36  | 0.45  | 0.52  |
| s, saturation flow rate [veh/h]         | 1772  | 1775  | 1836  | 402   | 3547  | 1863  | 1612  |
| c, Capacity [veh/h]                     | 466   | 467   | 34    | 179   | 2038  | 982   | 850   |
| d1, Uniform Delay [s]                   | 37.18 | 37.30 | 50.87 | 24.18 | 14.84 | 21.07 | 24.09 |
| k, delay calibration                    | 0.31  | 0.31  | 0.11  | 0.50  | 0.50  | 0.50  | 0.50  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 15.99 | 17.28 | 16.15 | 1.34  | 1.50  | 8.94  | 25.97 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |       |        |        |        |
|---------------------------------------|--------|--------|-------|-------|--------|--------|--------|
| X, volume / capacity                  | 0.90   | 0.91   | 0.61  | 0.12  | 0.63   | 0.85   | 0.98   |
| d, Delay for Lane Group [s/veh]       | 53.18  | 54.58  | 67.02 | 25.51 | 16.34  | 30.00  | 50.06  |
| Lane Group LOS                        | D      | D      | E     | C     | B      | C      | D      |
| Critical Lane Group                   | No     | Yes    | Yes   | Yes   | No     | No     | Yes    |
| 50th-Percentile Queue Length [veh/ln] | 12.27  | 12.60  | 0.70  | 0.27  | 9.92   | 18.61  | 24.63  |
| 50th-Percentile Queue Length [ft/ln]  | 306.80 | 314.98 | 17.44 | 6.66  | 248.08 | 465.35 | 615.71 |
| 95th-Percentile Queue Length [veh/ln] | 18.02  | 18.42  | 1.26  | 0.48  | 15.09  | 25.69  | 32.77  |
| 95th-Percentile Queue Length [ft/ln]  | 450.43 | 460.52 | 31.39 | 11.99 | 377.23 | 642.23 | 819.18 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |       |       |       |       |       |       |       |       |      |       |       |
|---------------------------------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 53.82 | 0.00 | 54.58 | 67.02 | 67.02 | 67.02 | 25.51 | 25.51 | 16.34 | 0.00  | 0.00 | 32.13 | 50.06 |
| Movement LOS                    | D     |      | D     | E     | E     | E     | C     | C     | B     |       |      | C     | D     |
| d_A, Approach Delay [s/veh]     | 53.88 |      |       | 67.02 |       |       | 16.48 |       |       | 40.03 |      |       |       |
| Approach LOS                    | D     |      |       | E     |       |       | B     |       |       | D     |      |       |       |
| d_I, Intersection Delay [s/veh] | 35.22 |      |       |       |       |       |       |       |       |       |      |       |       |
| Intersection LOS                | D     |      |       |       |       |       |       |       |       |       |      |       |       |
| Intersection V/C                | 0.873 |      |       |       |       |       |       |       |       |       |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | 8 | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 31: Adelphi Rd/Campus Dr

Control Type: Signalized  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 180.6  
 Level Of Service: F  
 Volume to Capacity (v/c): 1.208

#### Intersection Setup

| Name                   | Adelphi Rd.                                                                       |        |        | Adelphi Rd.                                                                       |        |        | Campus Dr.                                                                          |        |        | Campus Dr.                                                                          |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration     |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement       | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 1      | 0                                                                                   | 0      | 0      |
| Pocket Length [ft]     | 350.00                                                                            | 100.00 | 500.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 250.00 | 100.00                                                                              | 100.00 | 100.00 |
| Speed [mph]            | 40.00                                                                             |        |        | 40.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk              | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Adelphi Rd. |        |        | Adelphi Rd. |        |        | Campus Dr. |        |        | Campus Dr. |        |        |
|-----------------------------------------|-------------|--------|--------|-------------|--------|--------|------------|--------|--------|------------|--------|--------|
| Base Volume Input [veh/h]               | 242         | 1536   | 43     | 174         | 1132   | 0      | 0          | 111    | 340    | 125        | 169    | 355    |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.27        | 2.08   | 2.27   | 2.00        | 2.05   | 0.00   | 0.00       | 2.00   | 2.21   | 2.00       | 2.00   | 2.00   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 15     | 0      | 0           | 28     | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Right-Turn on Red Volume [veh/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Total Hourly Volume [veh/h]             | 242         | 1551   | 43     | 174         | 1160   | 0      | 0          | 111    | 340    | 125        | 169    | 355    |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 1.0000 | 1.0000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 67          | 431    | 12     | 48          | 322    | 0      | 0          | 31     | 94     | 35         | 47     | 99     |
| Total Analysis Volume [veh/h]           | 269         | 1723   | 48     | 193         | 1289   | 0      | 0          | 123    | 378    | 139        | 188    | 394    |
| Presence of On-Street Parking           | No          |        | No     | No          |        | No     | No         |        | No     | No         |        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Local Bus Stopping Rate [/h]            | 0           | 0      | 0      | 0           | 0      | 0      | 0          | 0      | 0      | 0          | 0      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        | 0           |        |        | 0          |        |        | 0          |        |        |
| Bicycle Volume [bicycles/h]             | 0           |        |        | 0           |        |        | 0          |        |        | 0          |        |        |



**Intersection Settings**

|                           |                              |
|---------------------------|------------------------------|
| Located in CBD            | No                           |
| Signal Coordination Group | -                            |
| Cycle Length [s]          | 248                          |
| Coordination Type         | Time of Day Pattern Isolated |
| Actuation Type            | Fully actuated               |
| Offset [s]                | 0.0                          |
| Offset Reference          | LeadGreen                    |
| Permissive Mode           | SingleBand                   |
| Lost time [s]             | 12.00                        |

**Phasing & Timing**

| Control Type                 | Overlap | Permiss | Permiss | Overlap | Overlap | Permiss | Permiss | Split | Split | Split | Split | Split |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|-------|-------|-------|-------|-------|
| Signal group                 | 3       | 8       | 8       | 1       | 1       | 0       | 0       | 2     | 2     | 6     | 6     | 6     |
| Auxiliary Signal Groups      | 3,8     |         |         | 1,7     | 1,4     |         |         |       |       |       |       |       |
| Lead / Lag                   | Lag     | -       | -       | Lag     | -       | -       | -       | -     | -     | Lag   | -     | -     |
| Minimum Green [s]            | 5       | 8       | 8       | 15      | 15      | 0       | 0       | 25    | 25    | 5     | 5     | 5     |
| Maximum Green [s]            | 30      | 60      | 60      | 40      | 40      | 0       | 0       | 60    | 60    | 30    | 30    | 30    |
| Amber [s]                    | 4.0     | 4.0     | 4.0     | 4.0     | 4.0     | 0.0     | 0.0     | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   |
| All red [s]                  | 1.0     | 2.0     | 2.0     | 1.0     | 1.0     | 0.0     | 0.0     | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   |
| Split [s]                    | 35      | 66      | 66      | 50      | 50      | 0       | 0       | 66    | 66    | 36    | 36    | 36    |
| Vehicle Extension [s]        | 3.0     | 3.5     | 3.5     | 3.0     | 3.0     | 0.0     | 0.0     | 4.0   | 4.0   | 3.0   | 3.0   | 3.0   |
| Walk [s]                     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0     | 0     | 0     | 0     | 0     |
| Pedestrian Clearance [s]     | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0     | 0     | 0     | 0     | 0     |
| Rest In Walk                 |         | No      |         |         | No      |         |         | No    |       |       | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0     | 2.0     | 2.0     | 2.0     | 2.0     | 0.0     | 0.0     | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0     | 4.0     | 4.0     | 3.0     | 3.0     | 0.0     | 0.0     | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   |
| Minimum Recall               | Yes     | Yes     |         | Yes     | Yes     |         |         | Yes   |       |       | Yes   |       |
| Maximum Recall               | No      | No      |         | No      | No      |         |         | No    |       |       | No    |       |
| Pedestrian Recall            | No      | No      |         | No      | No      |         |         | No    |       |       | No    |       |
| Detector Location [ft]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Detector Length [ft]         | 30.0    | 30.0    | 30.0    | 30.0    | 30.0    | 0.0     | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| I, Upstream Filtering Factor | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C      | R     | L     | C     | C     | R     | C       | C     | R      |
|-----------------------------------------|-------|--------|-------|-------|-------|-------|-------|---------|-------|--------|
| C, Cycle Length [s]                     | 215   | 215    | 215   | 215   | 215   | 215   | 215   | 215     | 215   | 215    |
| L, Total Lost Time per Cycle [s]        | 5.50  | 6.00   | 6.00  | 5.00  | 6.00  | 6.00  | 6.00  | 6.00    | 6.00  | 6.00   |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 2.00    | 0.00  | 0.00   |
| l2, Clearance Lost Time [s]             | 0.00  | 4.00   | 4.00  | 0.00  | 0.00  | 4.00  | 4.00  | 4.00    | 4.00  | 4.00   |
| g_i, Effective Green Time [s]           | 94    | 60     | 60    | 108   | 115   | 54    | 54    | 30      | 30    | 30     |
| g / C, Green / Cycle                    | 0.44  | 0.28   | 0.28  | 0.50  | 0.53  | 0.25  | 0.25  | 0.14    | 0.14  | 0.14   |
| (v / s)_i Volume / Saturation Flow Rate | 0.38  | 0.34   | 0.03  | 0.06  | 0.36  | 0.03  | 0.24  | 0.00    | 0.11  | 0.25   |
| s, saturation flow rate [veh/h]         | 702   | 5070   | 1579  | 3445  | 3545  | 3547  | 1580  | 0       | 1695  | 1583   |
| c, Capacity [veh/h]                     | 323   | 1414   | 440   | 1732  | 1891  | 893   | 398   | 33      | 236   | 221    |
| d1, Uniform Delay [s]                   | 83.05 | 77.56  | 57.68 | 28.19 | 36.82 | 62.40 | 79.17 | 107.56  | 89.59 | 92.56  |
| k, delay calibration                    | 0.50  | 0.13   | 0.13  | 0.11  | 0.50  | 0.15  | 0.36  | 0.11    | 0.27  | 0.50   |
| l, Upstream Filtering Factor            | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00  | 1.00   |
| d2, Incremental Delay [s]               | 21.43 | 100.14 | 0.13  | 0.03  | 2.01  | 0.10  | 28.05 | 1434.06 | 13.71 | 370.65 |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00    | 0.00  | 0.00   |
| Rp, platoon ratio                       | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00  | 1.00   |
| PF, progression factor                  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00    | 1.00  | 1.00   |

**Lane Group Results**

|                                       |        |         |       |        |        |        |        |         |        |         |
|---------------------------------------|--------|---------|-------|--------|--------|--------|--------|---------|--------|---------|
| X, volume / capacity                  | 0.83   | 1.22    | 0.11  | 0.11   | 0.68   | 0.14   | 0.95   | 4.15    | 0.80   | 1.78    |
| d, Delay for Lane Group [s/veh]       | 104.48 | 177.70  | 57.81 | 28.22  | 38.83  | 62.50  | 107.22 | 1541.62 | 103.30 | 463.21  |
| Lane Group LOS                        | F      | F       | E     | C      | D      | E      | F      | F       | F      | F       |
| Critical Lane Group                   | No     | Yes     | No    | Yes    | Yes    | No     | Yes    | No      | No     | Yes     |
| 50th-Percentile Queue Length [veh/ln] | 11.54  | 39.07   | 1.98  | 2.70   | 25.36  | 2.66   | 23.76  | 15.23   | 11.11  | 35.12   |
| 50th-Percentile Queue Length [ft/ln]  | 288.61 | 976.64  | 49.54 | 67.60  | 634.12 | 66.53  | 593.91 | 380.66  | 277.66 | 877.94  |
| 95th-Percentile Queue Length [veh/ln] | 17.12  | 55.45   | 3.57  | 4.87   | 33.62  | 4.79   | 31.75  | 26.99   | 16.57  | 54.64   |
| 95th-Percentile Queue Length [ft/ln]  | 427.92 | 1386.21 | 89.17 | 121.68 | 840.61 | 119.75 | 793.75 | 674.69  | 414.29 | 1366.10 |

**Movement, Approach, & Intersection Results**

|                                 |        |        |       |       |       |      |       |       |        |         |        |        |
|---------------------------------|--------|--------|-------|-------|-------|------|-------|-------|--------|---------|--------|--------|
| d_M, Delay for Movement [s/veh] | 104.48 | 177.70 | 57.81 | 28.22 | 38.83 | 0.00 | 0.00  | 62.50 | 107.22 | 1541.62 | 103.30 | 463.21 |
| Movement LOS                    | F      | F      | E     | C     | D     |      |       | E     | F      | F       | F      | F      |
| d_A, Approach Delay [s/veh]     | 165.23 |        |       | 37.45 |       |      | 96.24 |       |        | 577.27  |        |        |
| Approach LOS                    | F      |        |       | D     |       |      | F     |       |        | F       |        |        |
| d_I, Intersection Delay [s/veh] | 180.65 |        |       |       |       |      |       |       |        |         |        |        |
| Intersection LOS                | F      |        |       |       |       |      |       |       |        |         |        |        |
| Intersection V/C                | 1.208  |        |       |       |       |      |       |       |        |         |        |        |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 6 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 5 | - | 8 | 7 | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report Intersection 32: Adelphi Rd/Toledo Rd

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 9.7  
Level Of Service: A  
Volume to Capacity (v/c): 0.501

#### Intersection Setup

| Name                   | Adelphi Rd                                                                        |        |        | Adelphi Rd                                                                         |        | Toledo Rd                                                                           |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach               | Northbound                                                                        |        |        | Southbound                                                                         |        | Eastbound                                                                           |        |
| Lane Configuration     |  |        |        |  |        |  |        |
| Turning Movement       | U-turn                                                                            | Left   | Thru   | Thru                                                                               | Right  | Left                                                                                | Right  |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Pocket | 1                                                                                 | 0      | 0      | 0                                                                                  | 1      | 0                                                                                   | 1      |
| Pocket Length [ft]     | 150.00                                                                            | 100.00 | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 200.00 |
| Speed [mph]            | 45.00                                                                             |        |        | 30.00                                                                              |        | 30.00                                                                               |        |
| Grade [%]              | 0.00                                                                              |        |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk              | Yes                                                                               |        |        | No                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Adelphi Rd |        |        | Adelphi Rd |        | Toledo Rd |        |
|-----------------------------------------|------------|--------|--------|------------|--------|-----------|--------|
| Base Volume Input [veh/h]               | 6          | 122    | 1087   | 758        | 118    | 169       | 90     |
| Base Volume Adjustment Factor           | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000    | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00       | 1.97   | 2.01   | 2.05       | 1.88   | 2.38      | 1.96   |
| Growth Rate                             | 1.00       | 1.00   | 1.00   | 1.00       | 1.00   | 1.00      | 1.00   |
| In-Process Volume [veh/h]               | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Site-Generated Trips [veh/h]            | 0          | 0      | 7      | 18         | 0      | 0         | 0      |
| Diverted Trips [veh/h]                  | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Pass-by Trips [veh/h]                   | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Existing Site Adjustment Volume [veh/h] | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Other Volume [veh/h]                    | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Right-Turn on Red Volume [veh/h]        | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Total Hourly Volume [veh/h]             | 6          | 122    | 1094   | 776        | 118    | 169       | 90     |
| Peak Hour Factor                        | 0.9000     | 0.9000 | 0.9000 | 0.9000     | 0.9000 | 0.9000    | 0.9000 |
| Other Adjustment Factor                 | 1.0000     | 1.0000 | 1.0000 | 1.0000     | 1.0000 | 1.0000    | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2          | 34     | 304    | 216        | 33     | 47        | 25     |
| Total Analysis Volume [veh/h]           | 7          | 136    | 1216   | 862        | 131    | 188       | 100    |
| Presence of On-Street Parking           | No         |        | No     | No         | No     | No        | No     |
| On-Street Parking Maneuver Rate [/h]    | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Local Bus Stopping Rate [/h]            | 0          | 0      | 0      | 0          | 0      | 0         | 0      |
| Pedestrian Volume [ped/h]               | 6          |        |        | 0          |        | 6         |        |
| Bicycle Volume [bicycles/h]             | 0          |        |        | 0          |        | 0         |        |

**Intersection Settings**

|                           |                |
|---------------------------|----------------|
| Located in CBD            | No             |
| Signal Coordination Group | -              |
| Cycle Length [s]          | 100            |
| Coordination Type         | Free Running   |
| Actuation Type            | Fully actuated |
| Offset [s]                | 20.0           |
| Offset Reference          | LeadGreen      |
| Permissive Mode           | SingleBand     |
| Lost time [s]             | 9.00           |

**Phasing & Timing**

| Control Type                 | Permissive | ProtectedP | Permissive | Permissive | Permissive | Split | Split |
|------------------------------|------------|------------|------------|------------|------------|-------|-------|
| Signal group                 | 5          | 5          | 2          | 6          | 6          | 4     | 4     |
| Auxiliary Signal Groups      |            |            |            |            |            |       |       |
| Lead / Lag                   | Lead       | Lead       | -          | -          | -          | Lag   | -     |
| Minimum Green [s]            | 4          | 4          | 4          | 4          | 4          | 4     | 4     |
| Maximum Green [s]            | 15         | 15         | 65         | 45         | 45         | 25    | 25    |
| Amber [s]                    | 4.0        | 4.0        | 4.0        | 4.0        | 4.0        | 4.0   | 4.0   |
| All red [s]                  | 1.0        | 1.0        | 1.0        | 1.0        | 1.0        | 1.0   | 1.0   |
| Split [s]                    | 30         | 30         | 30         | 30         | 30         | 30    | 30    |
| Vehicle Extension [s]        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Walk [s]                     | 0          | 0          | 7          | 7          | 7          | 7     | 7     |
| Pedestrian Clearance [s]     | 0          | 0          | 6          | 6          | 6          | 13    | 13    |
| Rest In Walk                 |            |            | No         | No         |            | No    |       |
| I1, Start-Up Lost Time [s]   | 2.0        | 2.0        | 2.0        | 2.0        | 2.0        | 2.0   | 2.0   |
| I2, Clearance Lost Time [s]  | 3.0        | 3.0        | 3.0        | 3.0        | 3.0        | 3.0   | 3.0   |
| Minimum Recall               |            | No         | No         | No         |            | No    |       |
| Maximum Recall               |            | No         | Yes        | Yes        |            | No    |       |
| Pedestrian Recall            |            | No         | No         | No         |            | No    |       |
| Detector Location [ft]       | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0   | 0.0   |
| Detector Length [ft]         | 30.0       | 30.0       | 30.0       | 30.0       | 30.0       | 30.0  | 30.0  |
| I, Upstream Filtering Factor | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.00  | 1.00  |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L    | C    | C    | R    | L     | R     |
|-----------------------------------------|------|------|------|------|-------|-------|
| C, Cycle Length [s]                     | 87   | 87   | 87   | 87   | 87    | 87    |
| L, Total Lost Time per Cycle [s]        | 5.00 | 5.00 | 5.00 | 5.00 | 5.00  | 5.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00 | 3.00 | 3.00 | 3.00 | 3.00  | 3.00  |
| g_i, Effective Green Time [s]           | 65   | 65   | 56   | 56   | 12    | 12    |
| g / C, Green / Cycle                    | 0.74 | 0.74 | 0.64 | 0.64 | 0.14  | 0.14  |
| (v / s)_i Volume / Saturation Flow Rate | 0.19 | 0.34 | 0.24 | 0.08 | 0.11  | 0.06  |
| s, saturation flow rate [veh/h]         | 766  | 3546 | 3545 | 1578 | 1767  | 1564  |
| c, Capacity [veh/h]                     | 612  | 2637 | 2261 | 1006 | 251   | 222   |
| d1, Uniform Delay [s]                   | 4.02 | 4.38 | 7.57 | 6.25 | 36.00 | 34.37 |
| k, delay calibration                    | 0.50 | 0.50 | 0.50 | 0.50 | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.89 | 0.58 | 0.49 | 0.27 | 4.43  | 1.42  |
| d3, Initial Queue Delay [s]             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |
| PF, progression factor                  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |        |        |       |        |       |
|---------------------------------------|-------|--------|--------|-------|--------|-------|
| X, volume / capacity                  | 0.23  | 0.46   | 0.38   | 0.13  | 0.75   | 0.45  |
| d, Delay for Lane Group [s/veh]       | 4.91  | 4.96   | 8.06   | 6.52  | 40.43  | 35.79 |
| Lane Group LOS                        | A     | A      | A      | A     | D      | D     |
| Critical Lane Group                   | No    | Yes    | No     | No    | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 0.56  | 2.66   | 3.50   | 0.91  | 4.09   | 2.01  |
| 50th-Percentile Queue Length [ft/ln]  | 14.10 | 66.62  | 87.50  | 22.86 | 102.14 | 50.13 |
| 95th-Percentile Queue Length [veh/ln] | 1.02  | 4.80   | 6.30   | 1.65  | 7.35   | 3.61  |
| 95th-Percentile Queue Length [ft/ln]  | 25.38 | 119.92 | 157.50 | 41.14 | 183.85 | 90.24 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |      |      |       |       |
|---------------------------------|-------|------|------|------|------|-------|-------|
| d_M, Delay for Movement [s/veh] | 4.91  | 4.91 | 4.96 | 8.06 | 6.52 | 40.43 | 35.79 |
| Movement LOS                    | A     | A    | A    | A    | A    | D     | D     |
| d_A, Approach Delay [s/veh]     | 4.95  |      |      | 7.86 |      | 38.82 |       |
| Approach LOS                    | A     |      |      | A    |      | D     |       |
| d_I, Intersection Delay [s/veh] | 9.74  |      |      |      |      |       |       |
| Intersection LOS                | A     |      |      |      |      |       |       |
| Intersection V/C                | 0.501 |      |      |      |      |       |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 33: Hamilton St/40th Pl/39th Ave

Control Type: All-way stop  
 Analysis Method: HCM 2010  
 Analysis Period: 15 minutes

Delay (sec / veh): 21.3  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.771

#### Intersection Setup

| Name                   | Magruder Park Ent |        |        |        | 39th Ave   |        |        |        | Hamilton St |        |        |        |
|------------------------|-------------------|--------|--------|--------|------------|--------|--------|--------|-------------|--------|--------|--------|
| Approach               | Northbound        |        |        |        | Southbound |        |        |        | Eastbound   |        |        |        |
| Lane Configuration     |                   |        |        |        |            |        |        |        |             |        |        |        |
| Turning Movement       | Left              | Thru   | Right  | Right2 | Left2      | Left   | Thru   | Right  | Left2       | Left   | Thru   | Right  |
| Lane Width [ft]        | 12.00             | 12.00  | 12.00  | 12.00  | 12.00      | 12.00  | 12.00  | 12.00  | 12.00       | 12.00  | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                 | 0      | 0      | 0      | 0          | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pocket Length [ft]     | 100.00            | 100.00 | 100.00 | 100.00 | 100.00     | 100.00 | 100.00 | 100.00 | 100.00      | 100.00 | 100.00 | 100.00 |
| Speed [mph]            | 30.00             |        |        |        | 30.00      |        |        |        | 35.00       |        |        |        |
| Grade [%]              | 0.00              |        |        |        | 0.00       |        |        |        | 0.00        |        |        |        |
| Crosswalk              | Yes               |        |        |        | Yes        |        |        |        | Yes         |        |        |        |

#### Volumes

| Name                                    | Magruder Park Ent |        |        |        | 39th Ave |        |        |        | Hamilton St |        |        |        |
|-----------------------------------------|-------------------|--------|--------|--------|----------|--------|--------|--------|-------------|--------|--------|--------|
| Base Volume Input [veh/h]               | 18                | 8      | 0      | 2      | 0        | 21     | 16     | 46     | 22          | 0      | 418    | 25     |
| Base Volume Adjustment Factor           | 1.0000            | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00              | 0.00   | 0.00   | 0.00   | 0.00     | 0.00   | 0.00   | 0.00   | 3.85        | 0.00   | 2.15   | 0.00   |
| Growth Rate                             | 1.00              | 1.00   | 1.00   | 1.00   | 1.00     | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 7      | 0      |
| Diverted Trips [veh/h]                  | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0                 | 0      | 0      | 0      | 0        | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 18                | 8      | 0      | 2      | 0        | 21     | 16     | 46     | 22          | 0      | 425    | 25     |
| Peak Hour Factor                        | 0.9000            | 0.9000 | 0.9000 | 0.9000 | 0.9000   | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000            | 1.0000 | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 5                 | 2      | 0      | 1      | 0        | 6      | 4      | 13     | 6           | 0      | 118    | 7      |
| Total Analysis Volume [veh/h]           | 20                | 9      | 0      | 2      | 0        | 23     | 18     | 51     | 24          | 0      | 472    | 28     |
| Pedestrian Volume [ped/h]               | 0                 |        |        |        | 0        |        |        |        | 0           |        |        |        |



**Intersection Settings**

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**Lanes**

|                                 |      |      |      |
|---------------------------------|------|------|------|
| Capacity per Entry Lane [veh/h] | 522  | 571  | 680  |
| Degree of Utilization, x        | 0.06 | 0.16 | 0.77 |

**Movement, Approach, & Intersection Results**

|                                    |       |       |        |
|------------------------------------|-------|-------|--------|
| 95th-Percentile Queue Length [veh] | 0.19  | 0.57  | 7.33   |
| 95th-Percentile Queue Length [ft]  | 4.72  | 14.27 | 183.17 |
| Approach Delay [s/veh]             | 10.33 | 10.51 | 23.77  |
| Approach LOS                       | B     | B     | C      |
| Intersection Delay [s/veh]         | 21.28 |       |        |
| Intersection LOS                   | C     |       |        |

**Intersection Setup**

| Name                   | Hamilton St                                                                       |        |        |        | Gallatin St                                                                         |        |        |        |
|------------------------|-----------------------------------------------------------------------------------|--------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|--------|
| Approach               | Westbound                                                                         |        |        |        | Northwestbound                                                                      |        |        |        |
| Lane Configuration     |  |        |        |        |  |        |        |        |
| Turning Movement       | Left2                                                                             | Left   | Thru   | Right  | Left                                                                                | Thru   | Right  | Right2 |
| Lane Width [ft]        | 12.00                                                                             | 12.00  | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00  |
| No. of Lanes in Pocket | 0                                                                                 | 0      | 0      | 0      | 0                                                                                   | 0      | 0      | 0      |
| Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00 |
| Speed [mph]            | 30.00                                                                             |        |        |        | 35.00                                                                               |        |        |        |
| Grade [%]              | 0.00                                                                              |        |        |        | 0.00                                                                                |        |        |        |
| Crosswalk              | Yes                                                                               |        |        |        | Yes                                                                                 |        |        |        |

**Volumes**

| Name                                    | Hamilton St |        |        |        | Gallatin St |        |        |        |
|-----------------------------------------|-------------|--------|--------|--------|-------------|--------|--------|--------|
| Base Volume Input [veh/h]               | 0           | 0      | 67     | 5      | 10          | 431    | 8      | 0      |
| Base Volume Adjustment Factor           | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 0.00        | 0.00   | 2.20   | 0.00   | 0.00        | 2.18   | 0.00   | 0.00   |
| Growth Rate                             | 1.00        | 1.00   | 1.00   | 1.00   | 1.00        | 1.00   | 1.00   | 1.00   |
| In-Process Volume [veh/h]               | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0           | 0      | 0      | 0      | 0           | 12     | 0      | 0      |
| Diverted Trips [veh/h]                  | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0           | 0      | 0      | 0      | 0           | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0           | 0      | 67     | 5      | 10          | 443    | 8      | 0      |
| Peak Hour Factor                        | 0.9000      | 0.9000 | 0.9000 | 0.9000 | 0.9000      | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor                 | 1.0000      | 1.0000 | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0           | 0      | 19     | 1      | 3           | 123    | 2      | 0      |
| Total Analysis Volume [veh/h]           | 0           | 0      | 74     | 6      | 11          | 492    | 9      | 0      |
| Pedestrian Volume [ped/h]               | 0           |        |        |        | 0           |        |        |        |

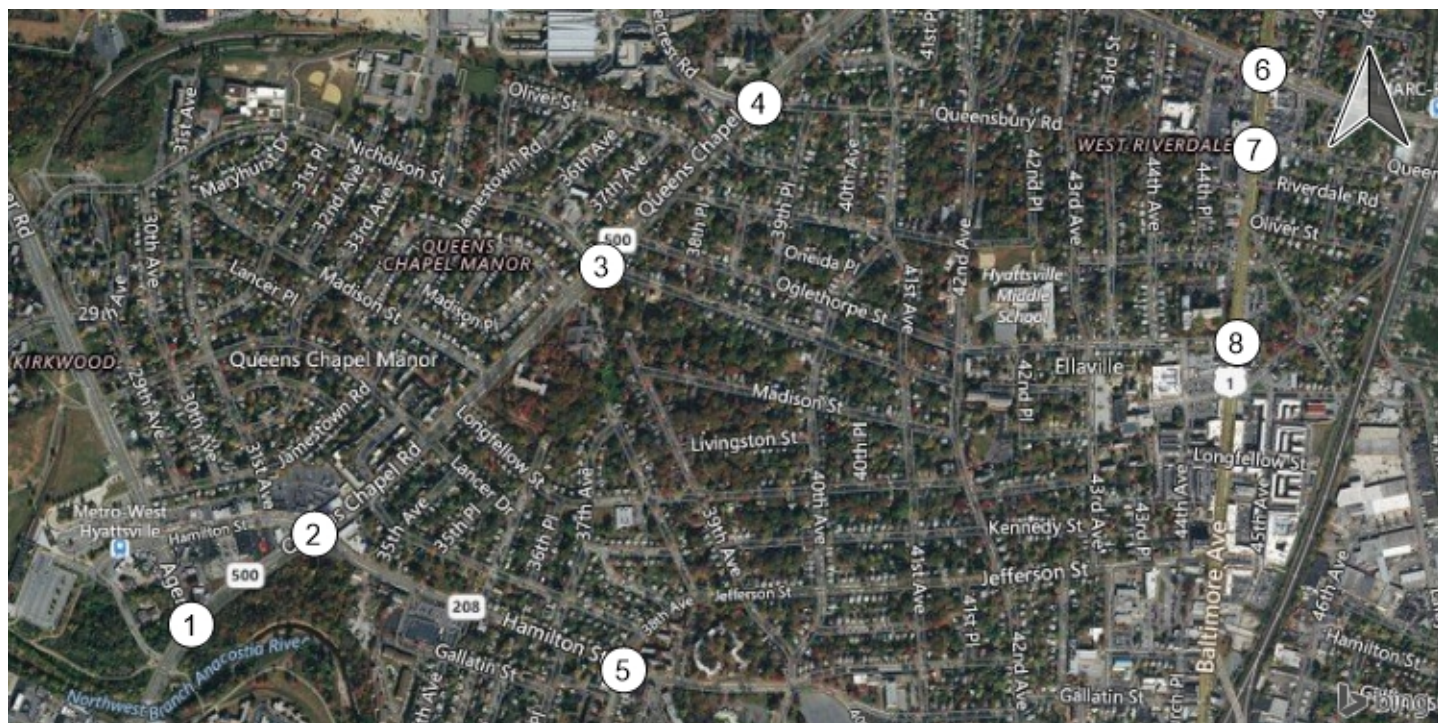
**Intersection Settings****Lanes**

|                                 |      |      |
|---------------------------------|------|------|
| Capacity per Entry Lane [veh/h] | 544  | 676  |
| Degree of Utilization, x        | 0.15 | 0.76 |

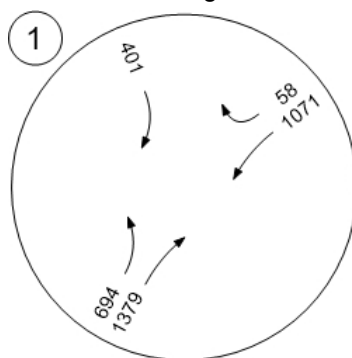
**Movement, Approach, & Intersection Results**

|                                    |       |        |
|------------------------------------|-------|--------|
| 95th-Percentile Queue Length [veh] | 0.51  | 6.98   |
| 95th-Percentile Queue Length [ft]  | 12.81 | 174.57 |
| Approach Delay [s/veh]             | 10.75 | 22.97  |
| Approach LOS                       | B     | C      |
| Intersection Delay [s/veh]         | 21.28 |        |
| Intersection LOS                   | C     |        |

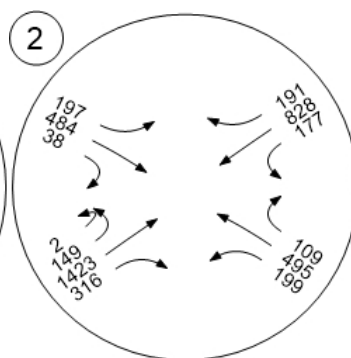
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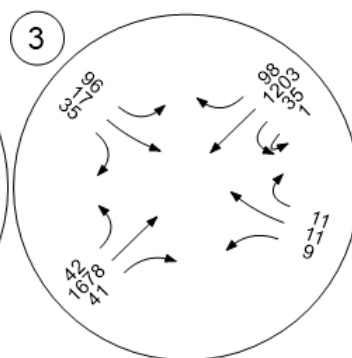
MD 500/Ager Rd



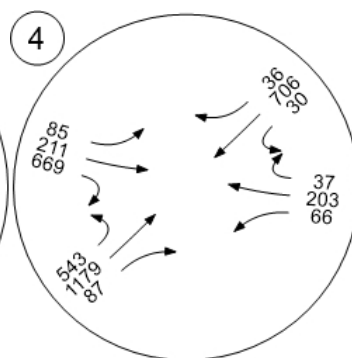
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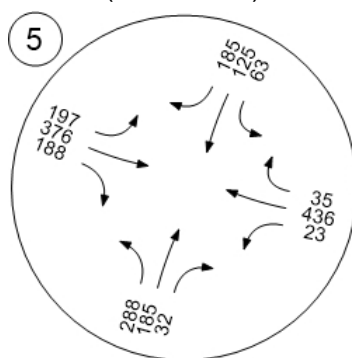
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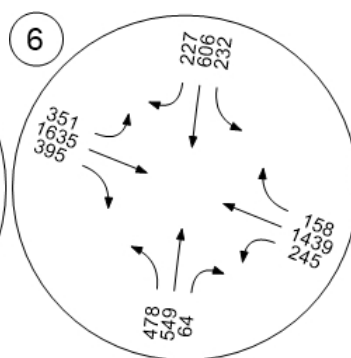
MD 500/Belcrest Rd/Queens



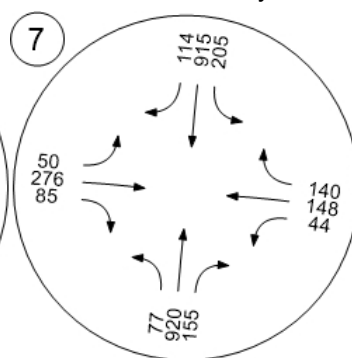
MD 208(Hamilton St)/38th Av



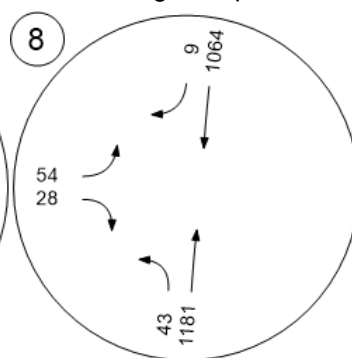
US 1/MD 410



US 1/Queensbury Rd

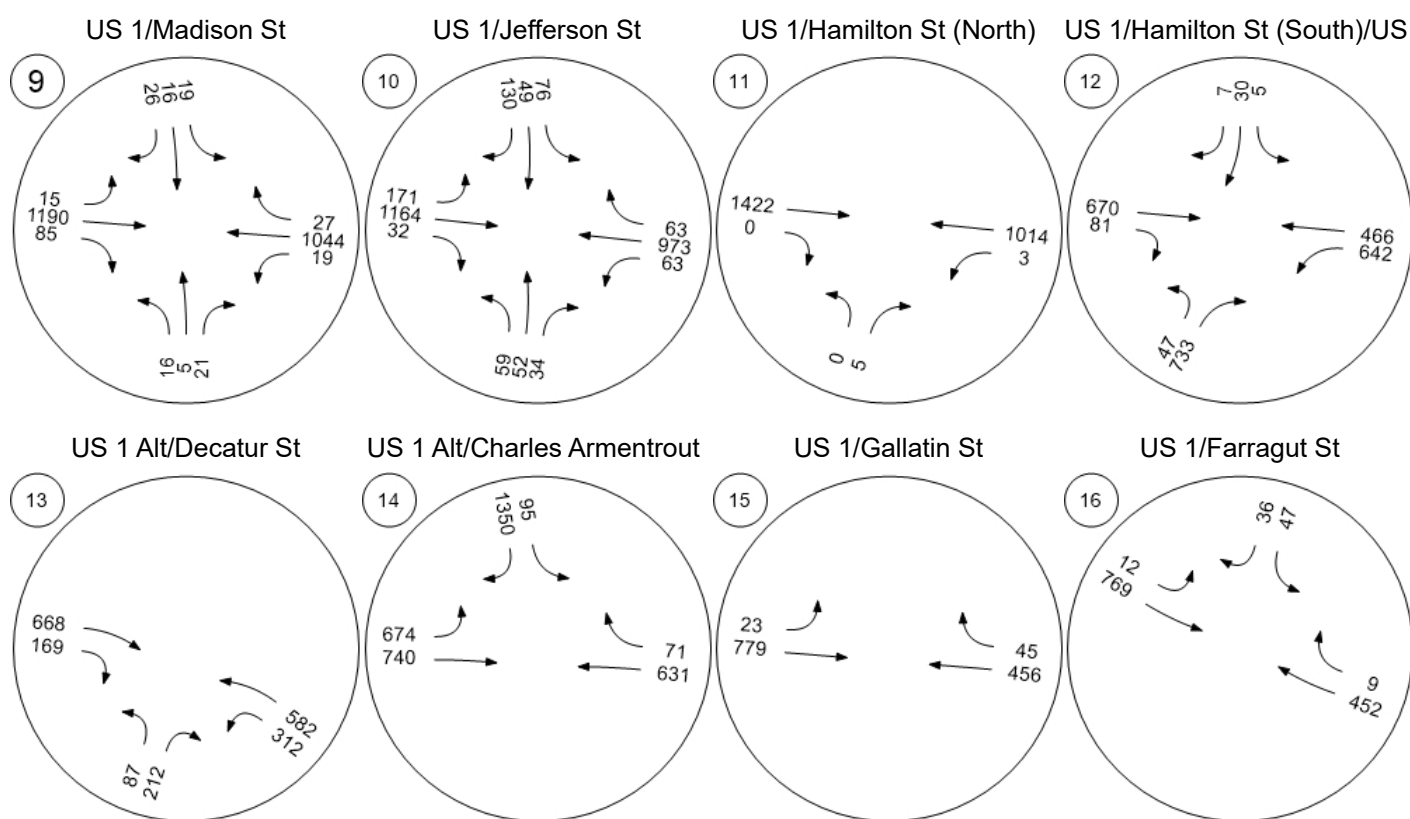


US 1/Oglethorpe Rd



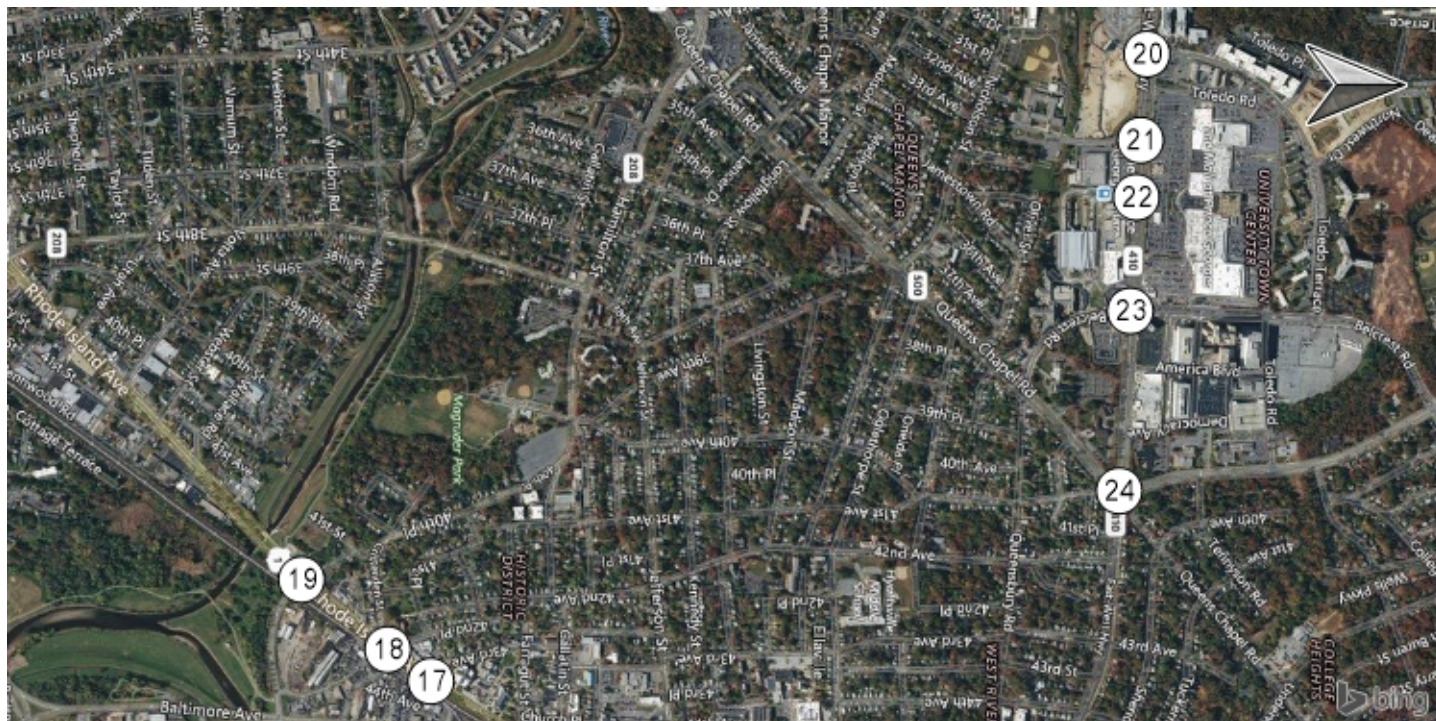


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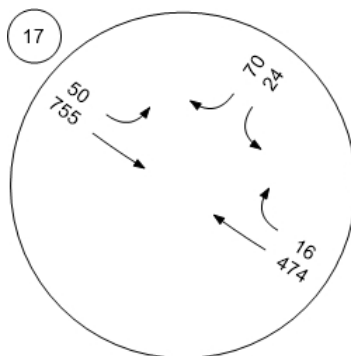




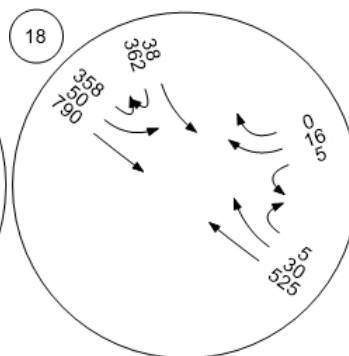
## Traffic Volume - Future Total Volume



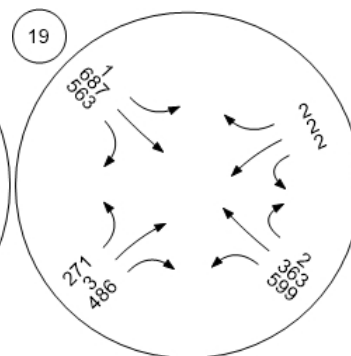
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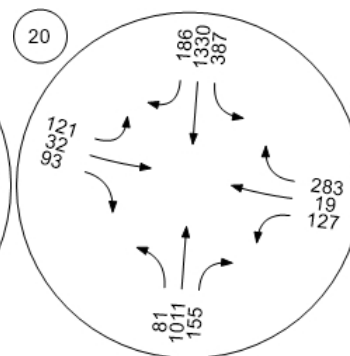
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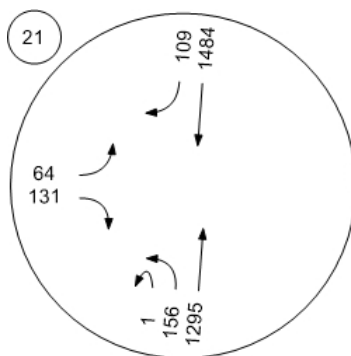
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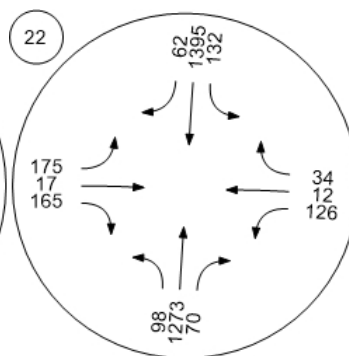
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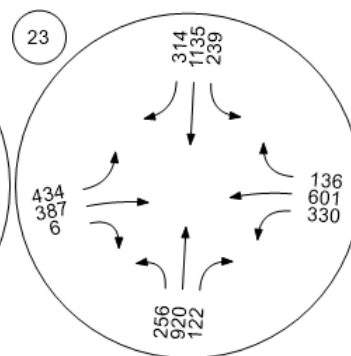
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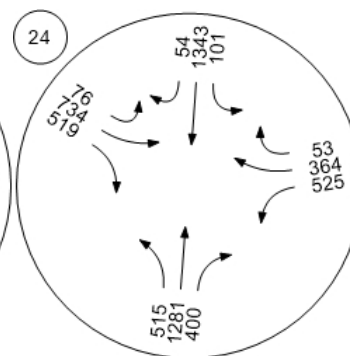
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MD 410/Belcrest Rd

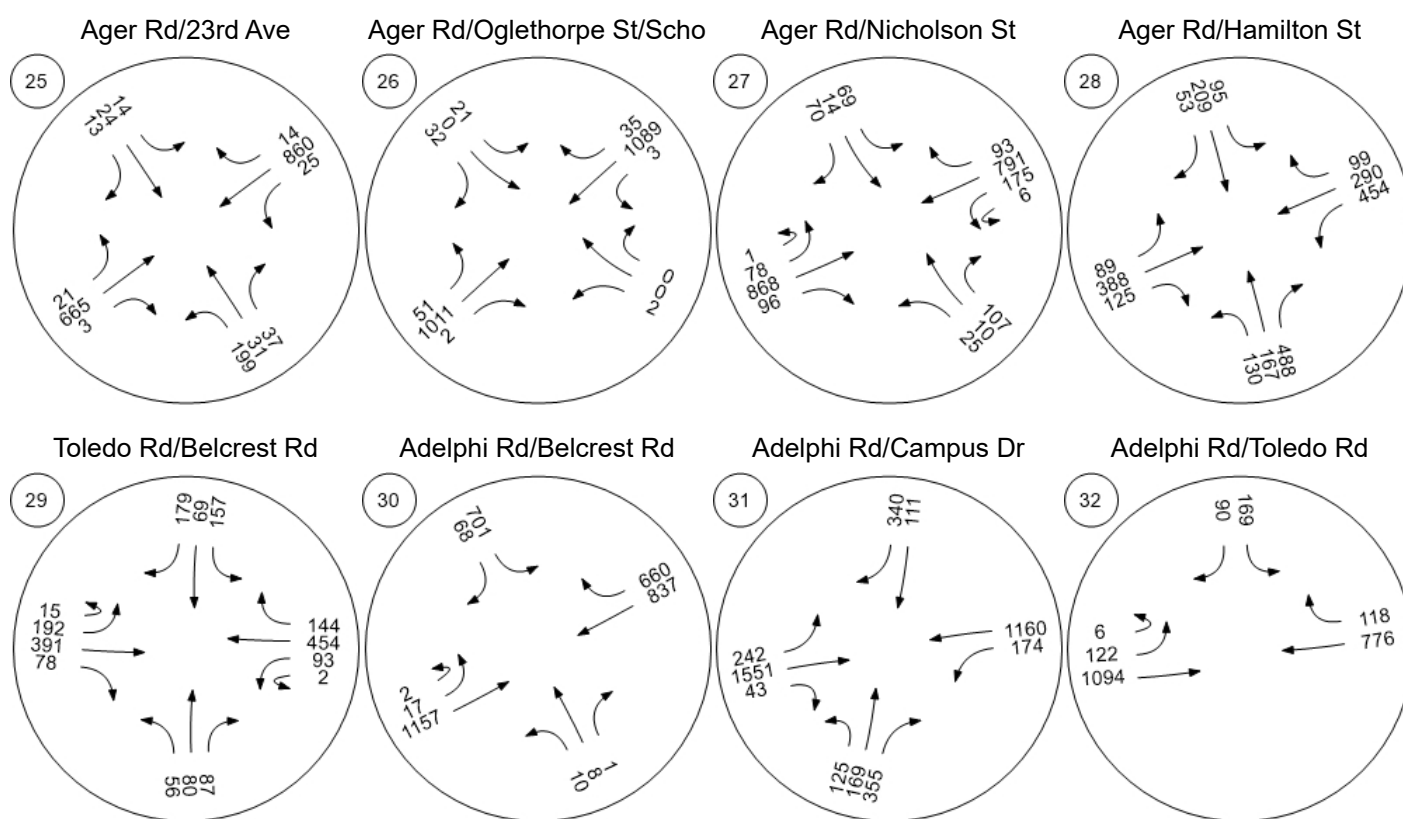
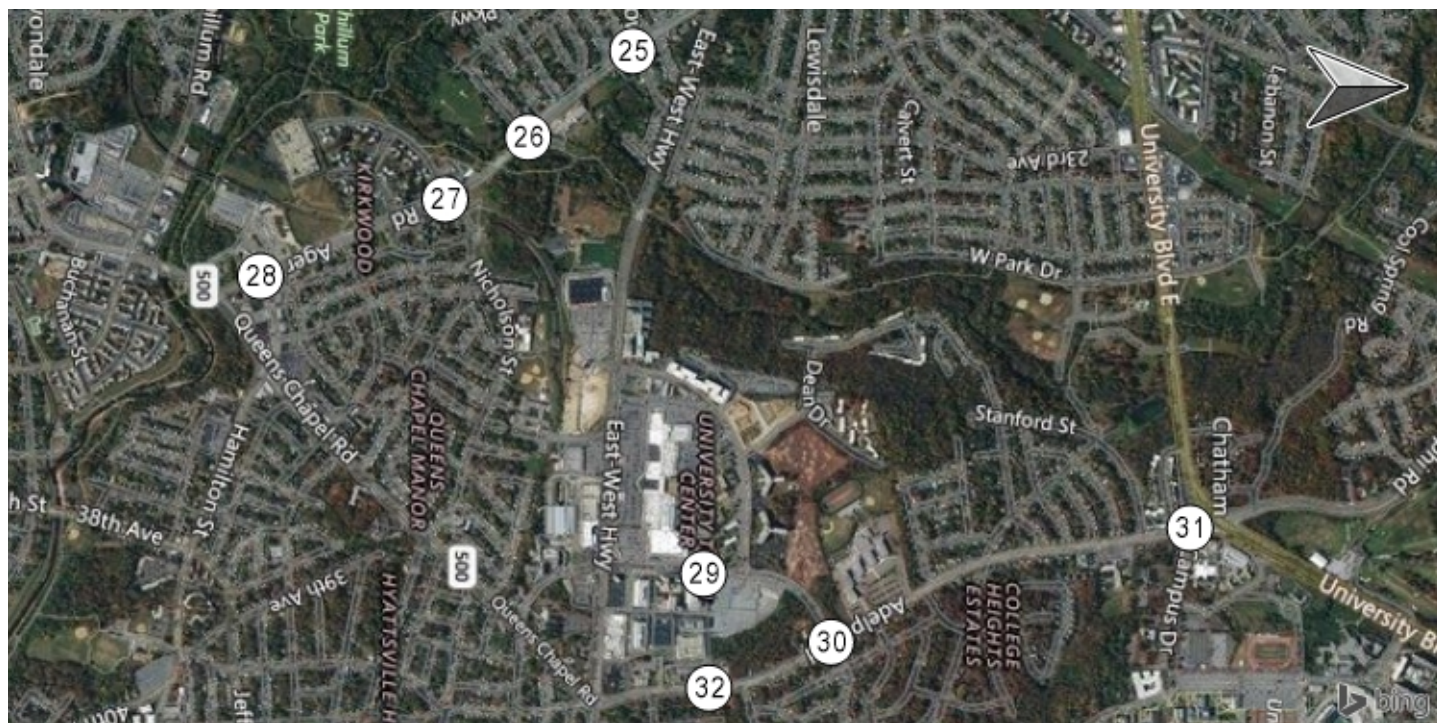


MD 410/MD 500/Adelphi Rd





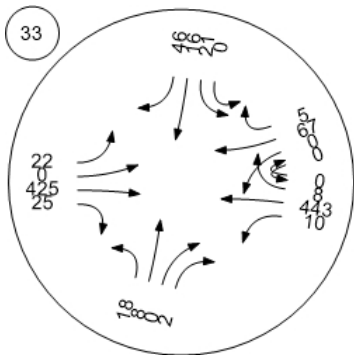
## Traffic Volume - Future Total Volume



Traffic Volume - Future Total Volume

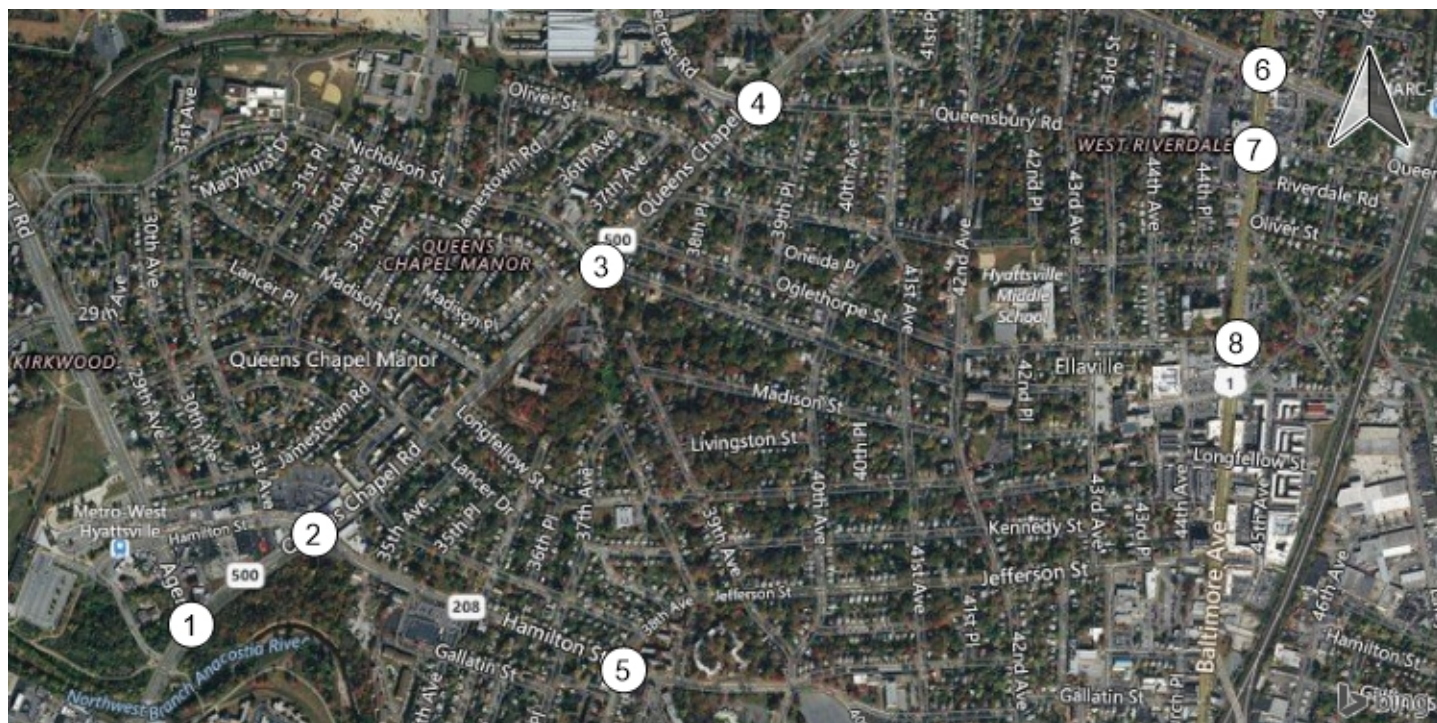


Hamilton St/40th Pl/39th Ave

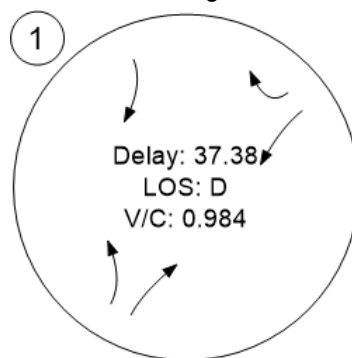




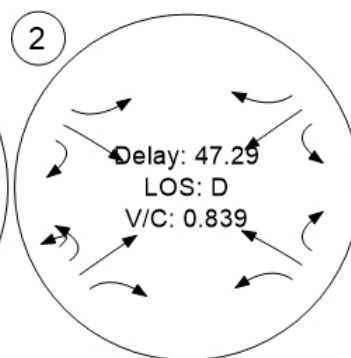
## Traffic Conditions



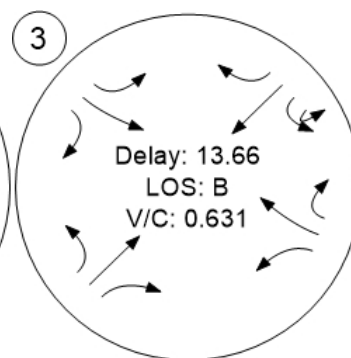
MD 500/Ager Rd



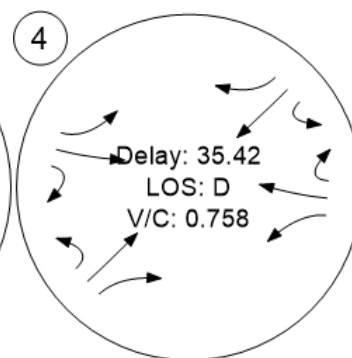
MD 500/Hamilton St



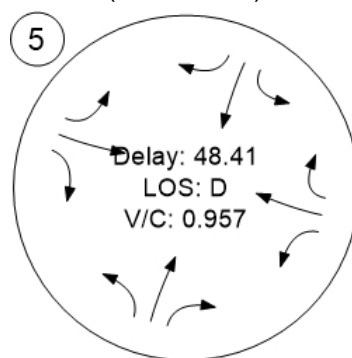
MD 500/Nicholson St



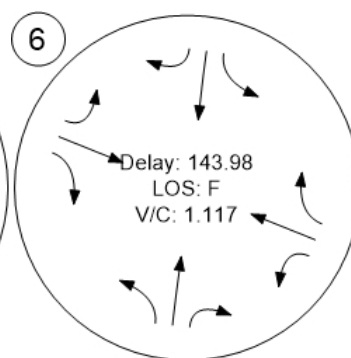
MD 500/Belcrest Rd/Queens



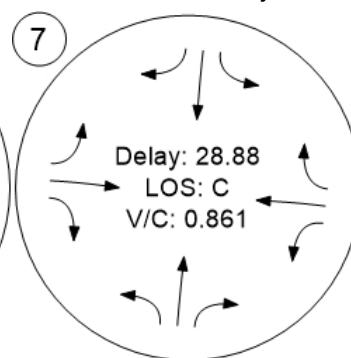
MD 208(Hamilton St)/38th Av



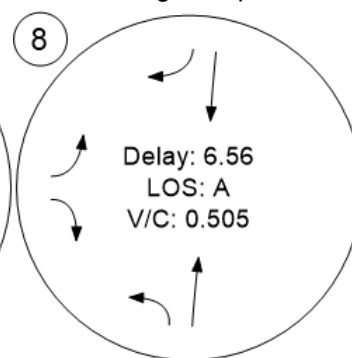
US 1/MD 410



US 1/Queensbury Rd

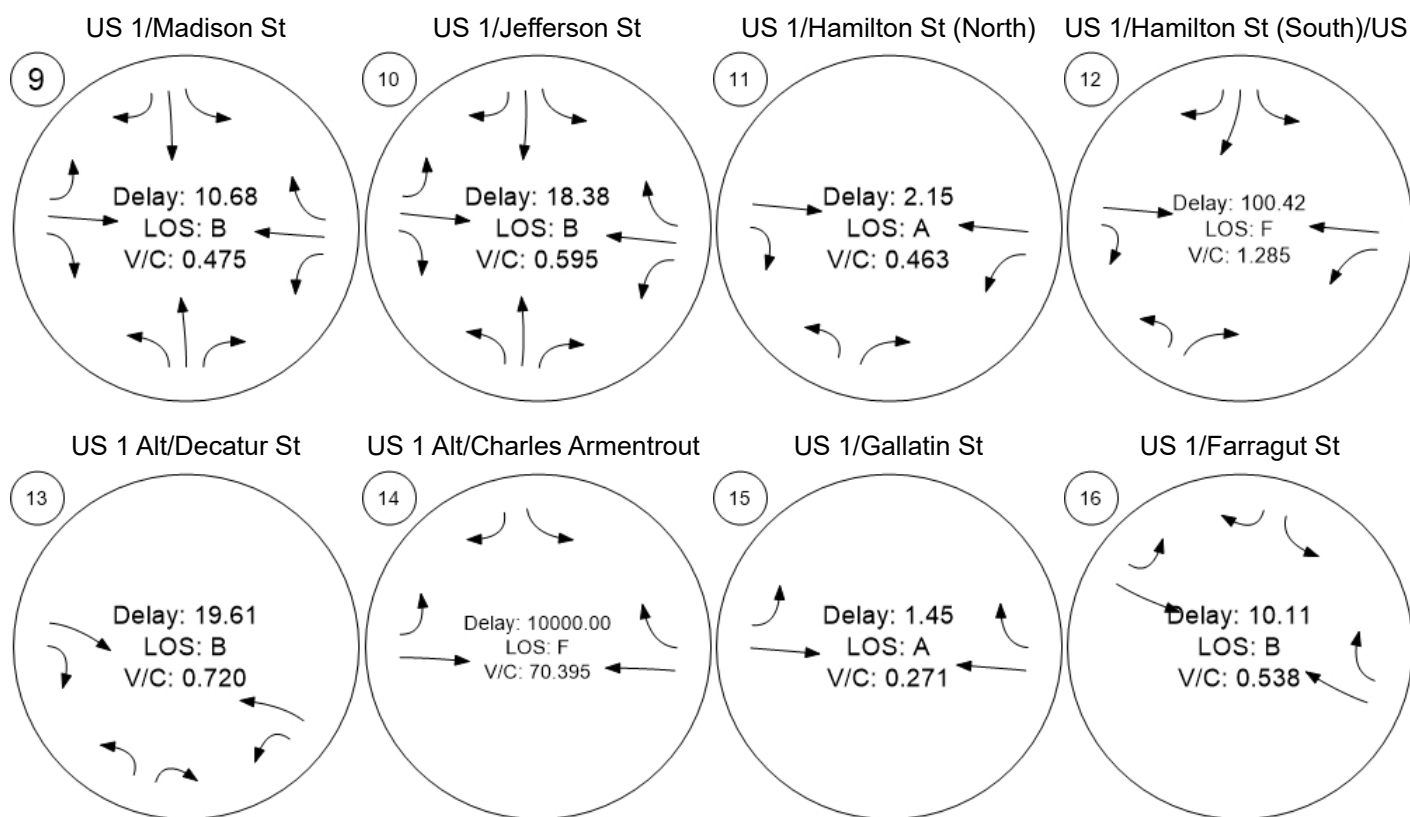
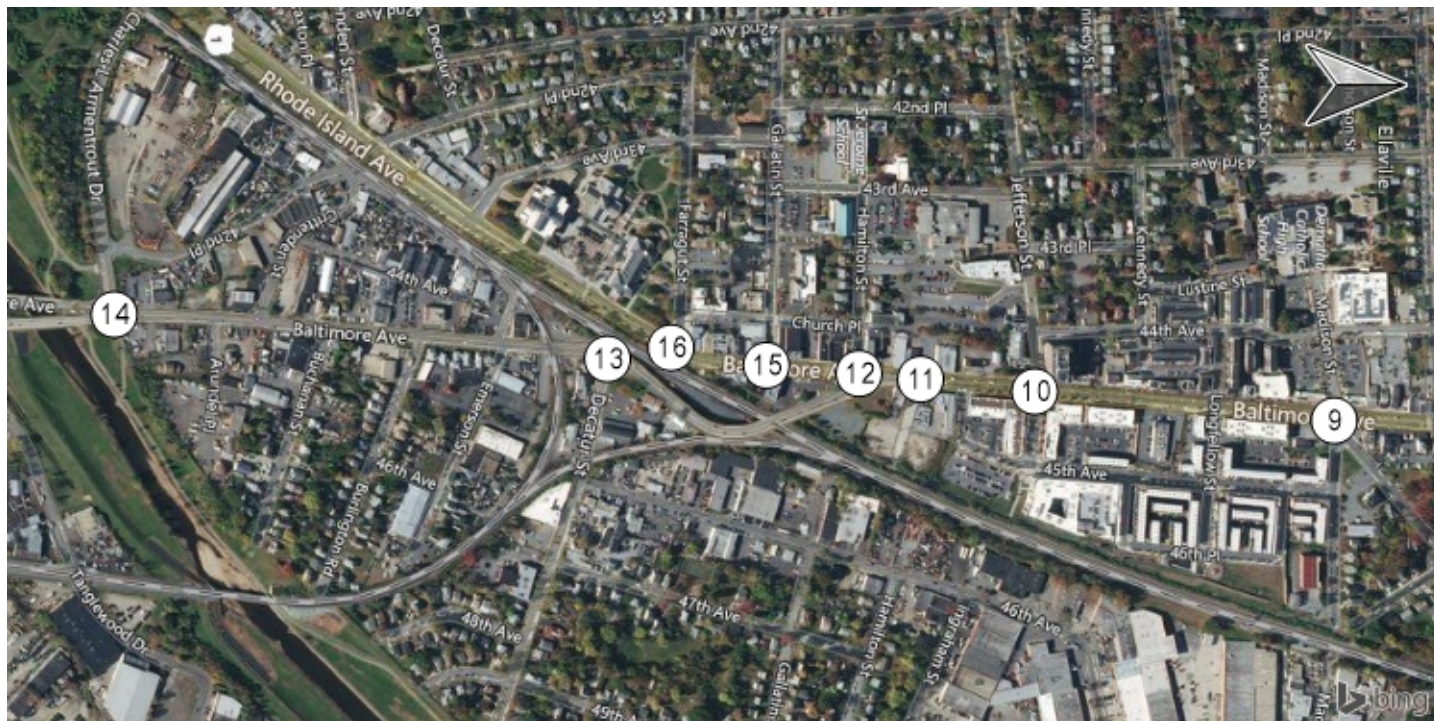


US 1/Oglethorpe Rd



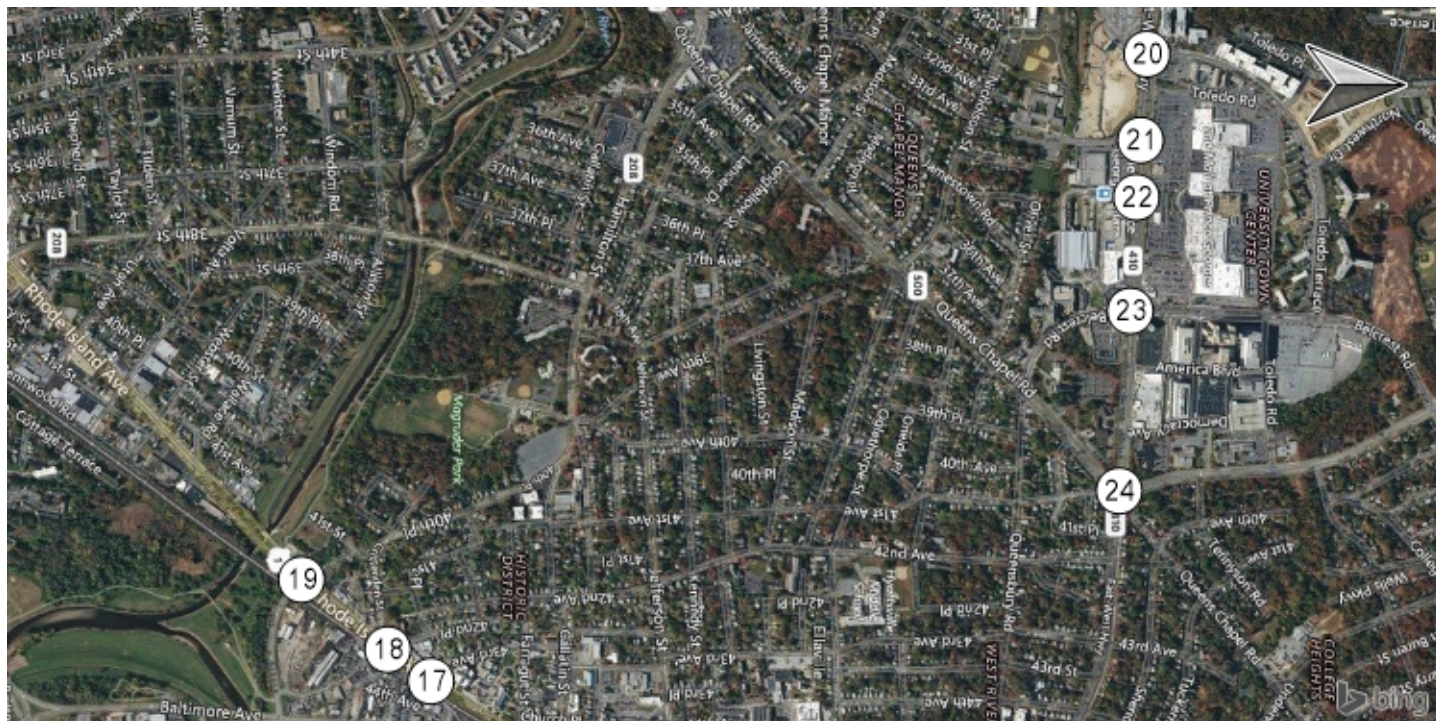


## Traffic Conditions

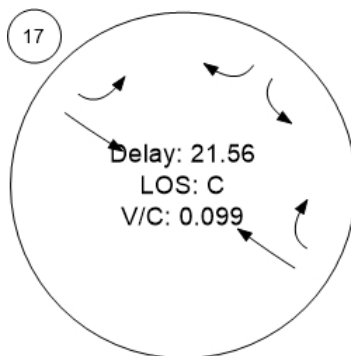




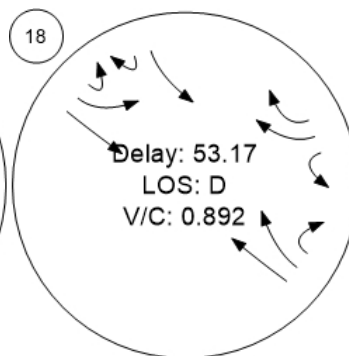
## Traffic Conditions



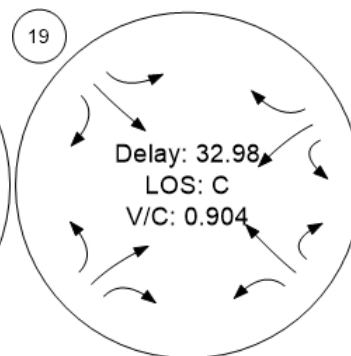
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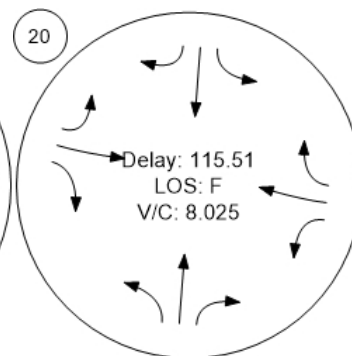
US 1/42nd Place/Crittendon



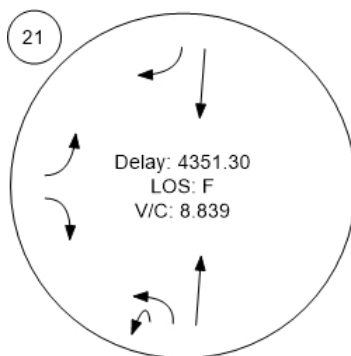
US 1/41st Place/Charles Arm



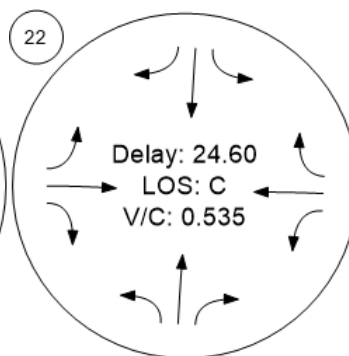
MD 410/Toledo Terrace



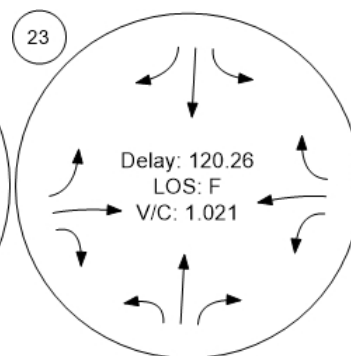
MD 410/Editors Park Dr



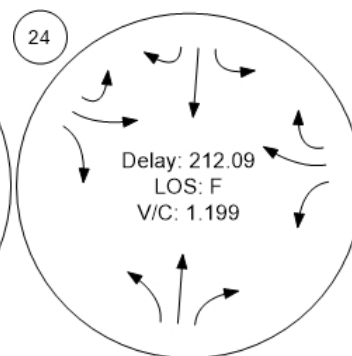
MD 410/Prince George's Plaz



MD 410/Belcrest Rd

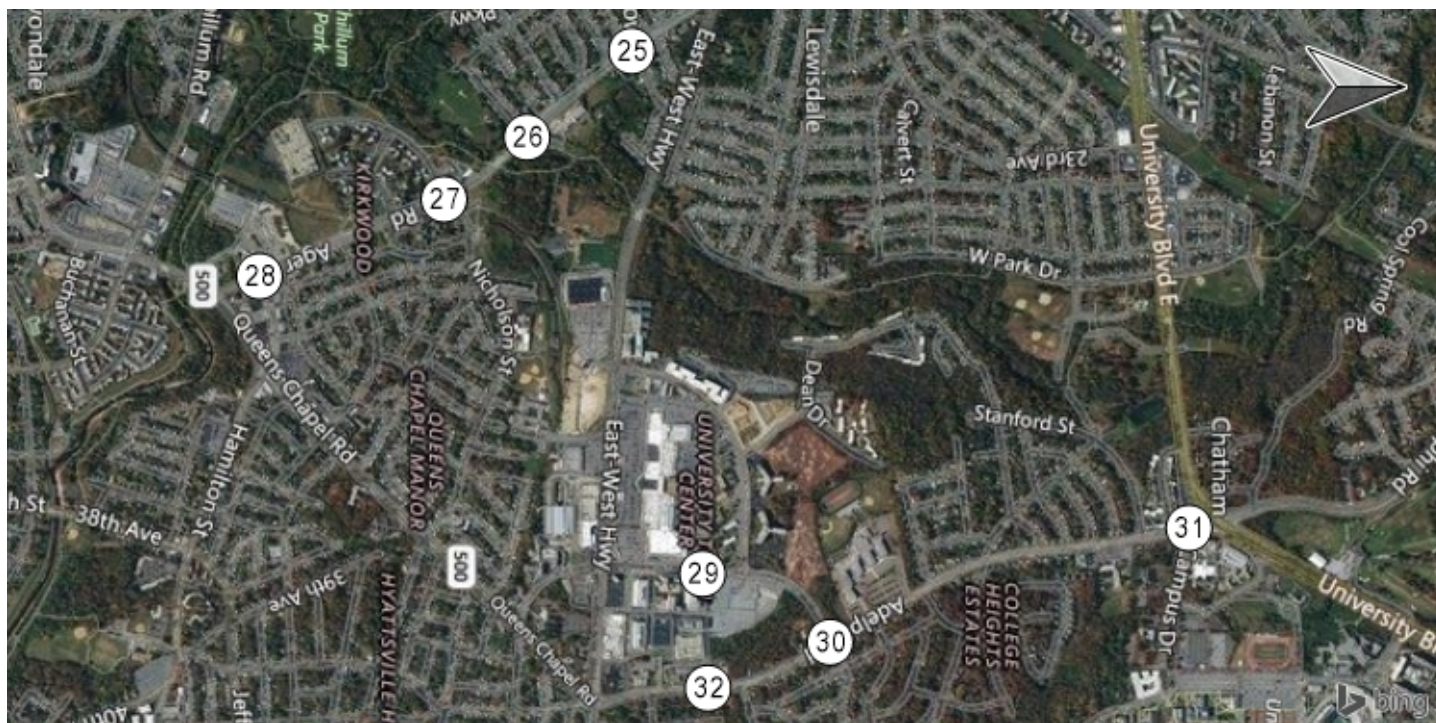


MD 410/MD 500/Adelphi Rd

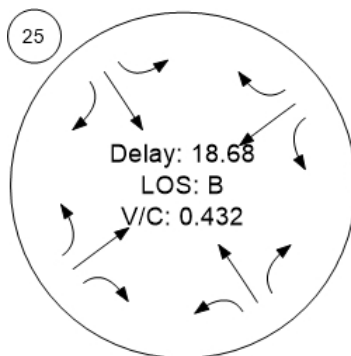




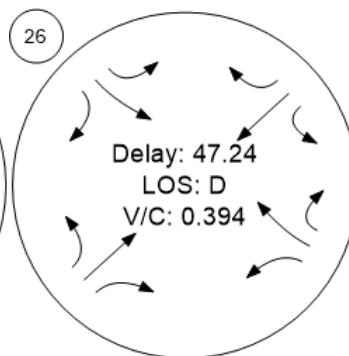
## Traffic Conditions



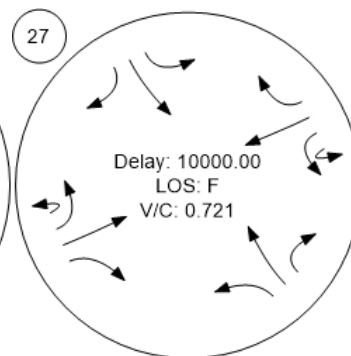
Ager Rd/23rd Ave



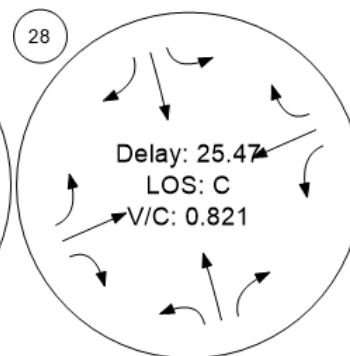
Ager Rd/Oglethorpe St/Scho



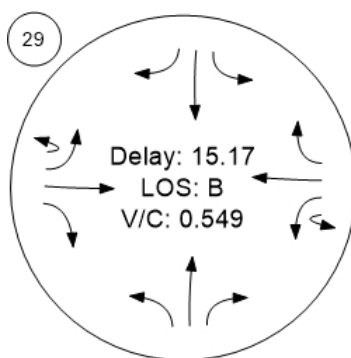
Ager Rd/Nicholson St



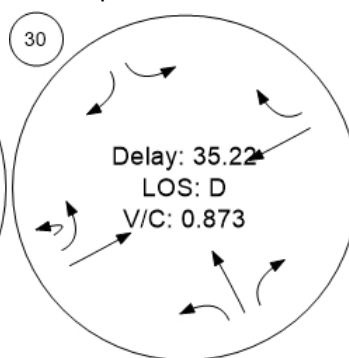
Ager Rd/Hamilton St



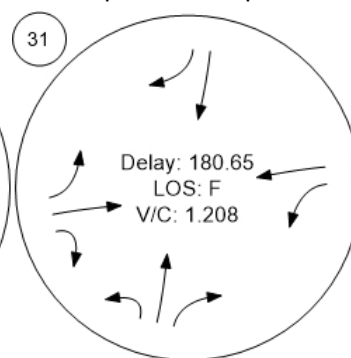
Toledo Rd/Belcrest Rd



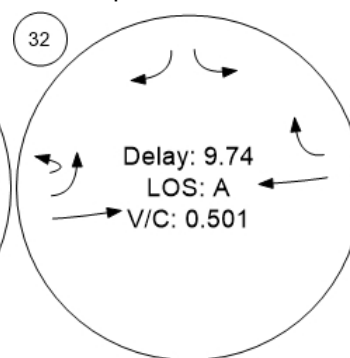
Adelphi Rd/Belcrest Rd



Adelphi Rd/Campus Dr



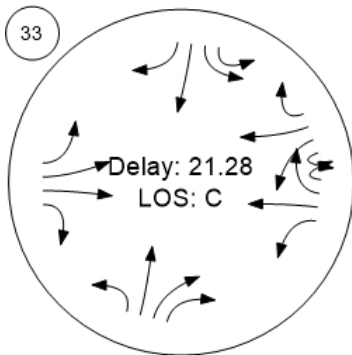
Adelphi Rd/Toledo Rd



Traffic Conditions



Hamilton St/40th Pl/39th Ave



## APPENDIX C: WAYFINDING SUBMITTAL

### INCLUDES:

1. Wayfinding Memorandum
2. Wayfinding Reference Guides: Bicycle, Vehicle, Pedestrian
3. General Notes and Installation Details
4. Fabrication Details: Bicycle, Vehicle, Pedestrian
5. Wayfinding Cost Estimate

### SUBMITTED SEPARATELY:

1. 3 KML files containing all sign locations: Bicycle, Vehicle, Pedestrian
2. Maps for the 5 Pedestrian Kiosks



**Date:** August 8, 2018  
**To:** Hal Metzler, Jr.  
**Organization:** City of Hyattsville  
**From:** Clea Baumhofer, EIT; Megan McCarty, EIT; Laura Barna, PE  
**Project:** Hyattsville Transportation Plan  
**Re:** Hyattsville Wayfinding Report

## HYATTSVILLE WAYFINDING REPORT

As part of the comprehensive Hyattsville Transportation Plan, Toole Design Group has prepared a wayfinding implementation plan, with content and fabrication details for wayfinding directed at pedestrians, bicyclists, and motor vehicle operators. This Wayfinding Report lays out both the methodology used to develop that plan and recommendations for its implementation.

## OBJECTIVES

Together with TDG, the City of Hyattsville identified and prioritized the objectives of this plan. These include:

- A cohesive system of wayfinding signage throughout the City of Hyattsville
- A custom design that reflects the City of Hyattsville and its history
- An MUTCD-compliant design
- A plan that can be implemented over time and will adapt well to future expansion.

The decision-making throughout the process of creating a wayfinding plan was centered around achieving these objectives.

## GUIDANCE ON CURRENT REGULATIONS

TDG researched current local and regional regulations that could potentially restrict the ability to implement the new wayfinding signs, or could impede their efficacy. These laws are noted below, along with recommendations on how to implement wayfinding signs and bicycle routes within the current laws, and on how to amend the existing laws to prevent conflicts with implementation.

### SIGNS AND SIDEWALKS

---

From the Hyattsville Charter and Code, Chapter 105—Streets and Sidewalks:

“§ 105-7. Projecting signs. [Amended 3-3-80 by HB No. 9-80] No sign or board shall project over any sidewalk without permission from the City Council.”

While the wayfinding signs are to be placed adjacent to the roadway and in a landscaped buffer where it exists, there are locations where the sidewalks in Hyattsville are directly adjacent to the roadway where wayfinding signage will project over the sidewalk, such as in the Gateway Arts District. To comply with MUTCD standards, all signs will be installed a minimum of 7' above the roadway and sidewalk to promote pedestrian safety.

However, the five pedestrian kiosk signs are to be placed on the sidewalk in commercial centers. This is not governed by the MUTCD and should follow the Hyattsville Charter and Code, which requires permission from the City Council.

### SIDEWALK BICYCLE RIDING

---

In order to create a connected network of bicycle routes that serve the desired destinations, there are specific routes that direct bicyclists to use the sidewalk to make brief connections.

The current law states:

“§ 105-18. Riding bicycles upon sidewalks prohibited; exception. It shall be unlawful for any person to ride a bicycle upon any sidewalk in the City; provided, however, that this shall not be construed to apply to small children’s toy velocipedes or other light toy vehicles.”

Without using the sidewalk, some of the crossings or connections required may not be comfortable for most bicyclists to ride on, due to high speeds and/or volumes of vehicles, but these streets include key sections of the route. For this reason, TDG recommends that this law be changed to, at a minimum, exclude sidewalks along these key connections. In order of importance:

1. Queens Chapel Road, near the intersection with Hamilton Street
2. Adelphi Road
3. Hamilton Street between Queens Chapel Road and the West Hyattsville Metro
4. Belcrest Road

## DETERMINING DESTINATIONS

In order to develop a useful and practical wayfinding system, the first step was to determine key destinations throughout the City of Hyattsville. The following is a list of priorities identified by the City of Hyattsville for selecting destinations:



- Existing public transportation (Metro stations)
- Developed hubs, such as the Gateway Arts District and the Mall
- Trail networks surrounding Hyattsville
- Schools
- Parks

Using these priorities, TDG and the City of Hyattsville developed a list of destinations to be used in the wayfinding system. These destinations were sorted into a hierarchy of regional destinations, major local destinations, and other local destinations to prioritize frequency and placement of wayfinding signs along each route and for each mode. The destinations identified include:

#### Regional Destinations:

- Northwest Branch Trail
- University of Maryland
- Gateway Arts District
- Mall at Prince George's

#### Major Local Destinations:

- West Hyattsville Metro Station
- Prince George's Plaza Metro Station
- Historic District
- Magruder Park
- Queens Chapel Town Center
- Rhode Island Avenue Trolley Trail
- University Town Center

#### Other Local Destinations:

- Heurich Park
- University Hills Duck Pond Park
- Hyattsville Elementary
- Edward M. Felegy Elementary
- Nicholas Orem Middle
- Hyattsville Middle
- Northwestern High
- Hyattsville Branch Library
- Hyattsville Municipal Building
- Heritage Center
- Police Department
- Parking (Gateway Arts District, University Town Center, Queens Chapel Town Center)

## ROUTE DEVELOPMENT METHODOLOGY

After determining which specific destinations were to be served, TDG developed routes to connect destinations on bicycle, on foot, or by car.

### BICYCLE WAYFINDING

For bicycle wayfinding, comfort and safety of the bicyclist were the most important factors in identifying routes between destinations. Directness of route also played an important role. Bicyclists will be most willing to use short, lower-stress routes.

To identify lower-stress routes, the streets connecting the identified destinations were reviewed using Google Earth and Google Streetview. Particularly challenging intersections to traverse by bicycle were studied in person. Additionally, data was collected from the Hyattsville community through an online Wikimap and used to identify preferred routes throughout Hyattsville. This data is displayed in heat maps below.

Streets with multiple lanes of traffic and higher posted speeds were avoided where possible. Routes identified by the community as difficult for walking and biking or as carrying high volumes of traffic were also avoided where possible. See Figure 1: Difficult Routes for Walking and Biking and Figure 2: High Traffic Corridors, below.

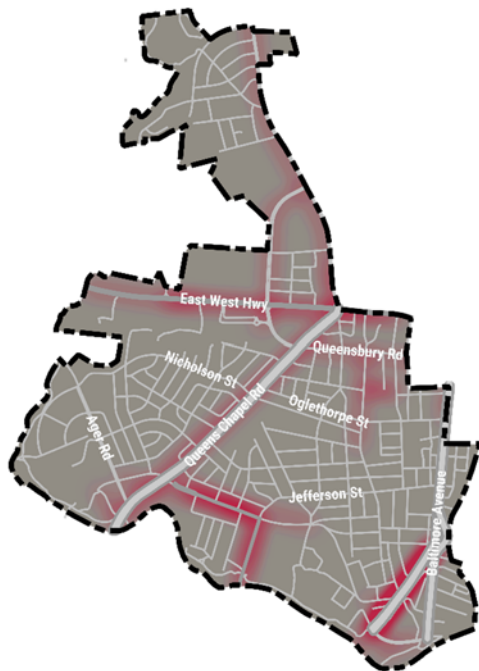


Figure 1: Difficult Routes for Walking and Biking

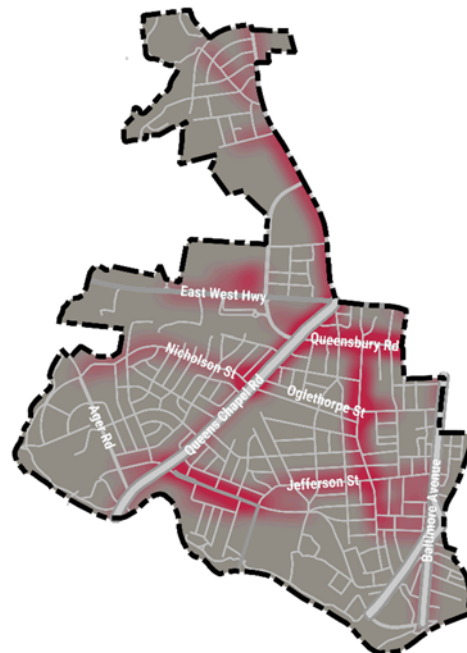


Figure 2: High Traffic Corridors

In the Google Earth and Google Streetview review, streets currently supported by bicycle signage and pavement markings were preferred. Streets currently used by bicyclists, as identified in the Wikimap survey, were also preferred. See Figure 3: Routes Users Walk and Bike, below.

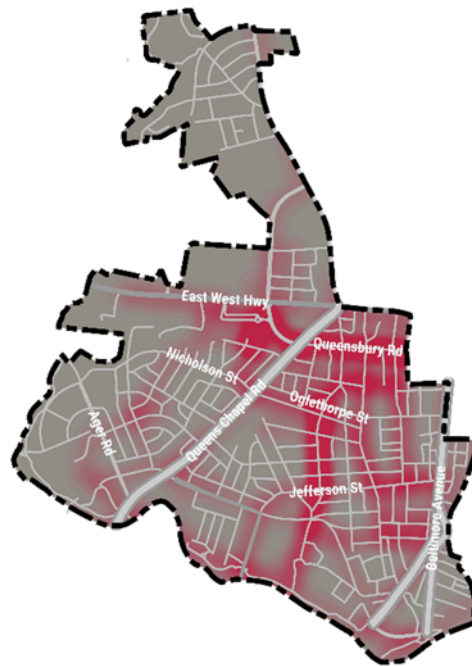


Figure 3: Routes Users Walk and Bike

Overall, the Bicycle Wayfinding Signage was designed to be the most comprehensive of the mode types. Bicyclists have more difficulty in accessing GPS or other mapping technologies than other modes, and must therefore have each turn mapped out along a route. Additionally, while a pedestrian has a limited distance he or she is willing to travel, a bicyclist can reasonably traverse the city of Hyattsville in a single trip. Therefore, the scope of bicycle wayfinding signage is larger and frequency of signage is higher than in pedestrian wayfinding.

## PEDESTRIAN WAYFINDING

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The existing pedestrian wayfinding is concentrated in the most highly developed areas of Hyattsville, where pedestrians have many destinations within a half-mile distance. Existing pedestrian wayfinding in the Gateway Arts District was found to be adequate and functional. When it comes time to replace the existing signage, TDG recommends the sign locations be moved directly onto Baltimore Ave where the sidewalk is wide enough to allow it. Existing signs belong to the Anacostia Trail Heritage Area, Inc. (ATHA) and modifications would need approval. TDG recommends that these signs remain in place until their normal replacement cycle.

New pedestrian kiosks at five key areas will supplement existing wayfinding. These kiosks will be both functional and statement pieces highlighting the new wayfinding design throughout Hyattsville. The kiosks will be placed at dense areas of high pedestrian use and at pedestrian entrance points to Hyattsville. Kiosk locations include:

- The heart of the Gateway Arts District
- Between the Mall at Prince George's and University Town Center
- The Trolley Trail entrance at the southern end of the Gateway Arts District
- West Hyattsville Metro Station

- Prince George's Plaza Metro Station

Additionally, the new bicycle signage will be accessible to pedestrians, and will supplement the existing pedestrian wayfinding and the new kiosk signs.

## VEHICULAR WAYFINDING

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Overall, existing vehicular wayfinding signage in Hyattsville was found to provide good information, but did not have a cohesive look. Some locations need additional signage to guide users, especially around one-way streets. A combined treatment of adding key signage and identifying other signs for replacement over time will create the most economical path to a comprehensive wayfinding system with a cohesive style.

Additional signs are necessary at key destinations, including entrances to metro stations, schools, and parking lots. These have been included in the current wayfinding design.

TDG recommends the following existing signage be highlighted for future replacement by signage with the same content but using Hyattsville's new signature wayfinding design:

- School signs
- Some Metro signs
- Parking signs

Currently, there are multiple styles of signage in use throughout the city. As other signage needs replacement with time, it should be replaced with basic, MUTCD-compliant signage. TDG recommends that Hyattsville standardize its requirements so that signage will become more cohesive over time. Signs for basic vehicle guidance, such as signs leading to highways or other local roads, should get a standard MUTCD-compliant treatment.

## FUTURE EXPANSION

As the City of Hyattsville changes over time, a corresponding update of the wayfinding system may be required. By following the principals in this report and using the new wayfinding design details, the wayfinding system can be expanded and adapted over time to continue to meet the needs of the City of Hyattsville.

Bicycle Wayfinding Sign Reference Guide

| Sign Point                                                                                                                                                                                                                                                                                                                                                                                                                                               | Intersection- See KML for Exact Location | Sign Face Orientation | Sign Type                     | Destination 1 |         |                                 |               | Destination 2 |        |                                 |               | Destination 3 |        |                         |               | Destination 4 |        |      |               | Sign Text Block Height (Inches) | Notes                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------|-------------------------------|---------------|---------|---------------------------------|---------------|---------------|--------|---------------------------------|---------------|---------------|--------|-------------------------|---------------|---------------|--------|------|---------------|---------------------------------|--------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                          |                       |                               | Arrow Direc   | Symbol  | Text                            | Detail Number | Arrow Direc   | Symbol | Text                            | Detail Number | Arrow Direc   | Symbol | Text                    | Detail Number | Arrow Direc   | Symbol | Text | Detail Number |                                 |                                                                                            |
| <div><div><div><div><div></div></div><div><div></div></div><div><div></div></div></div><div><div>- THROUGH (T)</div><div>- LEFT (L)</div><div>- DIAGONAL LEFT (DL)</div></div></div><div><div><div><div></div></div><div><div></div></div><div><div></div></div></div><div><div>- ADVANCE TURN ARROW "THROUGH-LEFT" (TL)</div><div>- RIGHT (R)</div><div>- DIAGONAL RIGHT (DR)</div><div>ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)</div></div></div></div> |                                          |                       |                               |               |         |                                 |               |               |        |                                 |               |               |        |                         |               |               |        |      |               |                                 |                                                                                            |
| B1                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Wells Blvd and Stanford St               | NW                    | Destination                   | T             |         | Mall at Prince George's         | 1/2/3         | T             |        | Gateway Arts Dist               | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B2                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Wells Blvd and Stanford St               | SE                    | Destination                   | T             |         | University Hills Duck Pond Park | 1/2/3         | TL            |        | NW Branch Trail                 | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B3                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Wells Blvd and Adelphi Rd                | NW                    | Destination                   | R             |         | Mall at Prince George's         | 1/2/3         | R             |        | Gateway Arts Dist               | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B4                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Adelphi Rd and Wells Blvd                | SE                    | Destination                   | T             |         | Univ of Maryland                | 1/2/3         | L             |        | University Hills Duck Pond Park | 1/2/3         | L             |        | NW Branch Trail         | 1/2/3         |               |        |      |               | 28                              |                                                                                            |
| B5                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Adelphi Rd and Van Buren St              | SE                    | Destination                   | T             |         | NW Branch Trail                 | 1/2/3         | T             |        | Univ of Maryland                | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B6                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Adelphi Rd and Belcrest Rd               | NW                    | Destination with Metro Symbol | R             |         | Mall at Prince George's         | 1/2/3         | R             | Metro  | Pr George's Pl                  | 1/2/4         | R             |        | Gateway Arts Dist       | 1/2/3         |               |        |      |               | 28                              |                                                                                            |
| B7                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Belcrest Rd and Adelphi Rd               | SW                    | Destination                   | L             |         | NW Branch Trail                 | 1/2/3         | L             |        | Univ of Maryland                | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B8                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Belcrest Rd and Toledo Rd                | N                     | Destination with Metro Symbol | T             |         | Mall at Prince George's         | 1/2/3         | T             | Metro  | Pr George's Pl                  | 1/2/4         | L             |        | Library                 | 1/2/3         |               |        |      |               | 28                              |                                                                                            |
| B9                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Belcrest Rd and Toledo Rd                | S                     | Destination                   | T             |         | Univ of Maryland                | 1/2/3         | R             |        | Library                         | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B10                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Belcrest Rd and Liberty Ln               | N                     | Destination with Metro Symbol | T             | Metro   | Pr George's Pl                  | 1/2/4         | TL            |        | Univ Town Center                | 1/2/3         | R             |        | Mall at Prince George's | 1/2/3         |               |        |      |               | 28                              |                                                                                            |
| B11                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Belcrest Rd and Liberty Ln               | S                     | Destination                   | TL            |         | Mall at Prince George's         | 1/2/3         | R             |        | Univ Town Center                | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B12                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Metro Driveway and Belcrest Rd           | W                     | Destination                   | L             |         | Mall at Prince George's         | 1/2/3         | R             |        | Gateway Arts Dist               | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              | May need to move off Metro property. Confirm with City of Hyattsville before installation. |
| B13                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Belcrest Rd and Metro Driveway           | SE                    | Destination with Metro Symbol | T             |         | Mall at Prince George's         | 1/2/3         | T             |        | Univ Town Center                | 1/2/3         | L             | Metro  | Pr George's Pl          | 1/2/4         |               |        |      |               | 28                              |                                                                                            |
| B14                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Queensbury Rd and Queens Chapel Rd       | SE                    | Destination with Metro Symbol | T             | Metro   | Pr George's Pl                  | 1/2/4         |               |        |                                 |               |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B15                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Belcrest Rd and Queens Chapel Rd         | W                     | Bike Route                    | T             | Bicycle |                                 | 1/6           |               |        |                                 |               |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B16                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Queensbury Rd and 41st Ave               | W                     | Destination Double Arrow      | T             |         | Trolley Trail                   | 1/2/3         | T             |        | Hyattsville Middle School       | 1/2/3         | T&R           |        | Gateway Arts Dist       | 1/2/5         |               |        |      |               | 28                              |                                                                                            |
| B17                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 41st Ave and Queensbury Rd               | S                     | Destination with Metro Symbol | L             | Metro   | Pr George's Pl                  | 1/2/4         | L             |        | Mall at Prince George's         | 1/2/3         | R             |        | Trolley Trail           | 1/2/3         |               |        |      |               | 28                              |                                                                                            |
| B18                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Queensbury Rd and 41st Ave               | E                     | Destination with Metro Symbol | T             | Metro   | Pr George's Pl                  | 1/2/4         | T             |        | Mall at Prince George's         | 1/2/3         | L             |        | Gateway Arts Dist       | 1/2/3         |               |        |      |               | 28                              |                                                                                            |
| B19                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Queensbury Rd and 42nd Ave               | W                     | Destination                   | T             |         | Trolley Trail                   | 1/2/3         | R             |        | Hyattsville Middle School       | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B20                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Queensbury Rd and 43rd Ave               | W                     | Destination                   | T             |         | Trolley Trail                   | 1/2/3         | R             |        | Gateway Arts Dist               | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B21                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 43rd Ave and Queensbury Rd               | S                     | Destination with Metro Symbol | L             | Metro   | Pr George's Pl                  | 1/2/4         | L             |        | Mall at Prince George's         | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B22                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 43rd Ave and Oglethorp St                | N                     | Bike Route                    | T             | Bicycle |                                 | 1/6           |               |        |                                 |               |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B23                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 43rd Ave and Oglethorp St                | S                     | Bike Route                    | T             | Bicycle |                                 | 1/6           |               |        |                                 |               |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B24                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 43rd Ave and Jefferson St                | N                     | Destination with Metro Symbol | L             |         | Gateway Arts Dist               | 1/2/3         | R             | Metro  | W Hyattsville                   | 1/2/4         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B25                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Jefferson St and 43rd Ave                | W                     | Destination                   | T             |         | Gateway Arts Dist               | 1/2/3         | R             |        | Hyattsville Elementary          | 1/2/3         |               |        |                         |               |               |        |      |               | 13                              |                                                                                            |
| B26                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Jefferson St and 43rd Ave                | E                     | Destination with Metro Symbol | T             | Metro   | W Hyattsville                   | 1/2/4         | R             |        | Pr George's Pl                  | 1/2/3         | R             |        | Mall at Prince George's | 1/2/3         |               |        |      |               | 28                              |                                                                                            |

Bicycle Wayfinding Sign Reference Guide

| Sign Point                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Intersection- See KML for Exact Location | Sign Face Orientation | Sign Type                     | Destination 1 |         |                                    |               | Destination 2 |        |                                |               | Destination 3 |        |                                  |               | Destination 4 |        |               |               | Sign Text Block Height (Inches) | Notes |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------|-------------------------------|---------------|---------|------------------------------------|---------------|---------------|--------|--------------------------------|---------------|---------------|--------|----------------------------------|---------------|---------------|--------|---------------|---------------|---------------------------------|-------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                       |                               | Arrow Direc   | Symbol  | Text                               | Detail Number | Arrow Direc   | Symbol | Text                           | Detail Number | Arrow Direc   | Symbol | Text                             | Detail Number | Arrow Direc   | Symbol | Text          | Detail Number |                                 |       |
| <div><div><div><div><div></div></div><div>- THROUGH (T)</div></div><div><div><div></div></div><div>- LEFT (L)</div></div><div><div><div></div></div><div>- DIAGONAL LEFT (DL)</div></div></div><div><div><div><div></div></div><div>-ADVANCE TURN ARROW "THROUGH-LEFT" (TL)</div></div><div><div><div></div></div><div>- RIGHT (R)</div></div><div><div><div></div></div><div>- DIAGONAL RIGHT (DR)</div></div><div><div><div></div></div><div>ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)</div></div></div></div> |                                          |                       |                               |               |         |                                    |               |               |        |                                |               |               |        |                                  |               |               |        |               |               |                                 |       |
| B27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Jefferson St and 42nd Ave                | E                     | Destination with Metro Symbol | T             |         | Magruder Park TO NW Branch Trail   | 1/2/3         | T             | Metro  | W Hyattsville                  | 1/2/4         | L             |        | Historic District                | 1/2/3         |               |        |               |               | 28                              |       |
| B28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd Ave and Jefferson St                | S                     | Destination with Metro Symbol | T             |         | Hyattsville Middle School          | 1/2/3         | L             | Metro  | W Hyattsville                  | 1/2/4         | R             |        | Gateway Arts Dist                | 1/2/3         |               |        |               |               | 28                              |       |
| B29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd Ave and Jefferson St                | N                     | Destination                   | T             |         | Trolley Trail                      | 1/2/3         | T             |        | Gateway Arts Dist              | 1/2/3         | L             |        | Magruder Park TO NW Branch Trail | 1/2/3         |               |        |               |               | 28                              |       |
| B30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd Ave and Hamilton St                 | S                     | Destination with Metro Symbol | T             |         | Gateway Arts Dist                  | 1/2/3         | L             |        | Magruder Park                  | 1/2/3         | L             | Metro  | W Hyattsville                    | 1/2/4         |               |        |               |               | 28                              |       |
| B31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Gallatin St and 42nd Ave                 | E                     | Destination with Metro Symbol | R             | Metro   | W Hyattsville                      | 1/2/4         |               |        |                                |               |               |        |                                  |               |               |        |               |               | 13                              |       |
| B32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Church Pl and Gallatin St                | S                     | Destination with Metro Symbol | T             |         | Heritage Center                    | 1/2/3         | L             |        | Municipal Bldg                 | 1/2/3         | L             |        | Historic District                | 1/2/3         | L             | Metro  | W Hyattsville | 1/2/4         | 28                              |       |
| B33                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Farragut St and Baltimore Ave            | W                     | Destination                   | T             |         | Trolley Trail Use Crosswalk        | 1/2/3         | L             |        | Heritage Center                | 1/2/3         | L             |        | Municipal Bldg                   | 1/2/3         |               |        |               |               | 28                              |       |
| B34                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Farragut St and Baltimore Ave            | E                     | Destination with Metro Symbol | R             |         | Heritage Center                    | 1/2/3         | R             |        | Municipal Bldg                 | 1/2/3         | R             | Metro  | W Hyattsville                    | 1/2/4         |               |        |               |               | 28                              |       |
| B35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Baltimore Ave and Trolley Trail          | W                     | Destination                   | L             |         | Univ of Maryland Via Trolley Trail | 1/2/3         | L             |        | College Park Via Trolley Trail | 1/2/3         |               |        |                                  |               |               |        |               |               | 28                              |       |
| B36                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd Ave and Farragut St                 | N                     | Destination                   | T             |         | NW Branch Trail                    | 1/2/3         | L             |        | Trolley Trail                  | 1/2/3         | L             |        | Gateway Arts Dist                | 1/2/3         |               |        |               |               | 28                              |       |
| B37                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd St and Farragut St                  | S                     | Destination with Metro Symbol | T             |         | Historic District                  | 1/2/3         | T             | Metro  | W Hyattsville                  | 1/2/4         | R             |        | Gateway Arts Dist                | 1/2/3         |               |        |               |               | 28                              |       |
| B38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd Ave and Decatur St                  | N                     | Destination                   | R             |         | NW Branch Trail                    | 1/2/3         |               |        |                                |               |               |        |                                  |               |               |        |               |               | 13                              |       |
| B39                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Decatur St and 42nd Ave                  | W                     | Destination with Metro Symbol | L             |         | Gateway Arts Dist                  | 1/2/3         | L             | Metro  | W Hyattsville                  | 1/2/4         |               |        |                                  |               |               |        |               |               | 13                              |       |
| B40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Decatur St and 42nd Ave                  | E                     | Destination                   | L             |         | NW Branch Trail                    | 1/2/3         |               |        |                                |               |               |        |                                  |               |               |        |               |               | 13                              |       |
| B41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd Ave and Decatur St                  | S                     | Destination with Metro Symbol | R             |         | Gateway Arts Dist                  | 1/2/3         | R             | Metro  | W Hyattsville                  | 1/2/4         |               |        |                                  |               |               |        |               |               | 13                              |       |
| B42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd Ave and Crittendon St               | N                     | Destination                   | R             |         | NW Branch Trail                    | 1/2/3         |               |        |                                |               |               |        |                                  |               |               |        |               |               | 13                              |       |
| B43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Crittendon St and 42nd Ave               | W                     | Destination with Metro Symbol | L             |         | Gateway Arts Dist                  | 1/2/3         | L             | Metro  | W Hyattsville                  | 1/2/4         |               |        |                                  |               |               |        |               |               | 13                              |       |
| B44                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Crittendon St and Trail Connection       | E                     | Destination                   | L             |         | NW Branch Trail                    | 1/2/3         |               |        |                                |               |               |        |                                  |               |               |        |               |               | 13                              |       |
| B45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Trail Connection and Crittendon St       | SW                    | Destination with Metro Symbol | R             |         | Gateway Arts Dist                  | 1/2/3         | R             | Metro  | W Hyattsville                  | 1/2/4         |               |        |                                  |               |               |        |               |               | 13                              |       |
| B46                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 41st Ave and Oliver St                   | N                     | Destination                   | DR            |         | Gateway Arts Dist                  | 1/2/3         |               |        |                                |               |               |        |                                  |               |               |        |               |               | 13                              |       |
| B47                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 40th Ave and Nicholson St                | NE                    | Destination                   | T             |         | Gateway Arts Dist                  | 1/2/3         | L             |        | Hyattsville Middle School      | 1/2/3         |               |        |                                  |               |               |        |               |               | 13                              |       |
| B48                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Nicholson St and 40th Ave                | SE                    | Destination with Metro Symbol | L             |         | Gateway Arts Dist                  | 1/2/3         | R             |        | Mall at Prince George's        | 1/2/3         | R             | Metro  | Pr George's Pl                   | 1/2/4         |               |        |               |               | 28                              |       |
| B49                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 40th Ave and Nicholson St                | SW                    | Destination with Metro Symbol | T             | Metro   | Pr George's Pl                     | 1/2/4         | T             |        | Mall at Prince George's        | 1/2/3         | R             |        | Hyattsville Middle School        | 1/2/3         |               |        |               |               | 28                              |       |
| B50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Nicholson St and 42nd Ave                | NW                    | Destination                   | L             |         | Hyattsville Middle School          | 1/2/3         |               |        |                                |               |               |        |                                  |               |               |        |               |               | 13                              |       |
| B51                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 40th St and Longfellow Ave               | N                     | Bike Route                    | T             | Bicycle |                                    | 1/6           |               |        |                                |               |               |        |                                  |               |               |        |               |               | 13                              |       |
| B52                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 40th St and Longfellow Ave               | S                     | Bike Route                    | T             | Bicycle |                                    | 1/6           |               |        |                                |               |               |        |                                  |               |               |        |               |               | 13                              |       |
| B53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 40th Ave and Jefferson St                | N                     | Destination with Metro Symbol | T             |         | Magruder Park                      | 1/2/3         | L             |        | Historic District              | 1/2/3         | L             |        | Gateway Arts Dist                | 1/2/3         | R             | Metro  | W Hyattsville | 1/2/4         | 28                              |       |
| B54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Jefferson St and 40th Ave                | E                     | Destination with Metro Symbol | T             | Metro   | W Hyattsville                      | 1/2/4         | L             |        | Magruder Park                  | 1/2/3         | R             |        | Mall at Prince George's          | 1/2/3         |               |        |               |               | 28                              |       |

Bicycle Wayfinding Sign Reference Guide

| Sign Point                                                                                                                                                                                                                                                                                                                                                               | Intersection- See KML for Exact Location | Sign Face Orientation | Sign Type                     | Destination 1 |         |                                        |               | Destination 2 |        |                         |               | Destination 3 |        |                         |               | Destination 4 |        |                                  |               | Sign Text Block Height (Inches) | Notes                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------|-------------------------------|---------------|---------|----------------------------------------|---------------|---------------|--------|-------------------------|---------------|---------------|--------|-------------------------|---------------|---------------|--------|----------------------------------|---------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                          |                                          |                       |                               | Arrow Direc   | Symbol  | Text                                   | Detail Number | Arrow Direc   | Symbol | Text                    | Detail Number | Arrow Direc   | Symbol | Text                    | Detail Number | Arrow Direc   | Symbol | Text                             | Detail Number |                                 |                                                                                                                                                                     |
| <div><div><div>↑</div><div>←</div><div>↙</div></div><div><div>- THROUGH (T)</div><div>- LEFT (L)</div><div>- DIAGONAL LEFT (DL)</div></div></div> <div><div>↖</div><div>→</div><div>↗</div></div> <div><div>- ADVANCE TURN ARROW "THROUGH-LEFT" (TL)</div><div>- RIGHT (R)</div><div>- DIAGONAL RIGHT (DR)</div><div>ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)</div></div> |                                          |                       |                               |               |         |                                        |               |               |        |                         |               |               |        |                         |               |               |        |                                  |               |                                 |                                                                                                                                                                     |
| B55                                                                                                                                                                                                                                                                                                                                                                      | 40th Ave and Jefferson St                | S                     | Destination with Metro Symbol | T             |         | Mall at Prince George's                | 1/2/3         | L             | Metro  | W Hyattsville           | 1/2/4         | R             |        | Historic District       | 1/2/3         | R             |        | Gateway Arts Dist                | 1/2/3         | 28                              |                                                                                                                                                                     |
| B56                                                                                                                                                                                                                                                                                                                                                                      | Jefferson St and 40th Ave                | W                     | Destination                   | T             |         | Historic District                      | 1/2/3         | T             |        | Gateway Arts Dist       | 1/2/3         | L             |        | Mall at Prince George's | 1/2/3         | R             |        | Magruder Park TO NW Branch Trail | 1/2/3         | 28                              |                                                                                                                                                                     |
| B57                                                                                                                                                                                                                                                                                                                                                                      | Hamilton St and 40th Ave                 | S                     | Destination with Metro Symbol | T             |         | Gateway Arts Dist                      | 1/2/3         | L             | Metro  | W Hyattsville           | 1/2/4         |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |
| B58                                                                                                                                                                                                                                                                                                                                                                      | 38th St and Gaines Alley                 | N                     | Destination                   | L&R           |         | NW Branch Trail                        | 1/2/5         | T             |        | Brentwood               | 1/2/3         |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |
| B59                                                                                                                                                                                                                                                                                                                                                                      | Hamilton St and 38th St                  | SE                    | Destination with Metro Symbol | T             |         | Police Dept                            | 1/2/3         | L             |        | NW Branch Trail         | 1/2/3         | R             | Metro  | W Hyattsville           | 1/2/4         |               |        |                                  |               | 28                              |                                                                                                                                                                     |
| B60                                                                                                                                                                                                                                                                                                                                                                      | 38th St and Jefferson St                 | NE                    |                               | T             |         | NW Branch Trail                        | 1/2/3         | L             |        | Magruder Park           | 1/2/3         | R             |        | Police Dept             | 1/2/3         |               |        |                                  |               | 28                              |                                                                                                                                                                     |
| B61                                                                                                                                                                                                                                                                                                                                                                      | 38th St and Jefferson St                 | SW                    | Destination with Metro Symbol | L             | Metro   | W Hyattsville                          | 1/2/4         |               |        |                         |               |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |
| B62                                                                                                                                                                                                                                                                                                                                                                      | 38th St and Jefferson St                 | NE                    | Destination with Metro Symbol | T             |         | Police Dept                            | 1/2/3         | R             | Metro  | W Hyattsville           | 1/2/4         |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |
| B63                                                                                                                                                                                                                                                                                                                                                                      | Jefferson St and 38th St                 | NW                    | Destination                   | L             |         | Gateway Arts Dist                      | 1/2/3         | R             |        | Magruder Park           | 1/2/3         |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |
| B64                                                                                                                                                                                                                                                                                                                                                                      | Jefferson St and Queens Chapel Rd        | SE                    | Destination with Metro Symbol | L             |         | Queens Chapel Town Center Use Sidewalk | 1/2/3         | L             | Metro  | W Hyattsville           | 1/2/4         |               |        |                         |               |               |        |                                  |               | 28                              |                                                                                                                                                                     |
| B65                                                                                                                                                                                                                                                                                                                                                                      | Queens Chapel Rd and Jefferson Dr        | SW                    | Destination                   | R             |         | Magruder Park                          | 1/2/3         | R             |        | Gateway Arts Dist       | 1/2/3         |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |
| B66                                                                                                                                                                                                                                                                                                                                                                      | Hamilton St and Queens Chapel Rd         | NE                    | Destination with Metro Symbol | R             | Metro   | W Hyattsville Use Crosswalk            | 1/2/4         |               |        |                         |               |               |        |                         |               |               |        |                                  |               | 13                              | Note: back to back with B67                                                                                                                                         |
| B67                                                                                                                                                                                                                                                                                                                                                                      | Hamilton St and Queens Chapel Rd         | SW                    | Bike Route                    | T             | Bicycle |                                        | 1/6           |               |        |                         |               |               |        |                         |               |               |        |                                  |               | 13                              | Note: back to back with B66                                                                                                                                         |
| B68                                                                                                                                                                                                                                                                                                                                                                      | Hamilton St and Queens Chapel Rd         | SW                    | Destination                   | R             |         | Gateway Arts Dist Use Crosswalk        | 1/2/3         |               |        |                         |               |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |
| B69                                                                                                                                                                                                                                                                                                                                                                      | Hamilton St and Queens Chapel Rd         | NW                    | Destination                   | TL            |         | Gateway Arts Dist Use Crosswalks       | 1/2/3         |               |        |                         |               |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |
| B70                                                                                                                                                                                                                                                                                                                                                                      | Hamilton St and 31st Ave                 | E                     | Destination with Metro Symbol | T             | Metro   | W Hyattsville                          | 1/2/4         | T             |        | NW Branch Trail         | 1/2/3         | R             |        | Heurich Park            | 1/2/3         |               |        |                                  |               | 28                              |                                                                                                                                                                     |
| B71                                                                                                                                                                                                                                                                                                                                                                      | 31st Ave and Hamilton St                 | N                     | Destination with Metro Symbol | L             |         | Gateway Arts Dist                      | 1/2/3         | R             | Metro  | W Hyattsville           | 1/2/4         |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |
| B72                                                                                                                                                                                                                                                                                                                                                                      | Hamilton St and Metro Driveway           | NE                    | Destination with Metro Symbol | T             | Metro   | W Hyattsville                          | 1/2/4         | T             |        | NW Branch Trail         | 1/2/3         |               |        |                         |               |               |        |                                  |               | 13                              | Location: Could be blocking the pedestrian warning sign. Would it be acceptable to replace one of the two "1 Hour Parking" Signs at this group of 5 parking spaces? |
| B73                                                                                                                                                                                                                                                                                                                                                                      | Hamilton St and 31st Ave                 | W                     | Destination                   | T             |         | Gateway Arts Dist                      | 1/2/3         | TL            |        | Mall at Prince George's | 1/2/3         | TL            |        | Heurich Park            | 1/2/3         |               |        |                                  |               | 28                              |                                                                                                                                                                     |
| B74                                                                                                                                                                                                                                                                                                                                                                      | Jamestown Rd and 31st Ave                | NE                    | Destination with Metro Symbol | L             |         | Queens Chapel Town Center              | 1/2/3         | L             | Metro  | W Hyattsville           | 1/2/4         | L             |        | Gateway Arts Dist       | 1/2/3         |               |        |                                  |               | 28                              |                                                                                                                                                                     |
| B75                                                                                                                                                                                                                                                                                                                                                                      | 31st St and Lancer Dr                    | SE                    | Bike Route                    | T             | Bicycle |                                        | 1/6           |               |        |                         |               |               |        |                         |               |               |        |                                  |               | 13                              |                                                                                                                                                                     |

Bicycle Wayfinding Sign Reference Guide

| Sign Point                                                                                                                                                                                                                                                                                                                  | Intersection- See KML for Exact Location | Sign Face Orientation | Sign Type                     | Destination 1 |         |                           |               | Destination 2 |        |                           |               | Destination 3 |        |                           |               | Destination 4 |        |                         |               | Sign Text Block Height (Inches) | Notes                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------|-------------------------------|---------------|---------|---------------------------|---------------|---------------|--------|---------------------------|---------------|---------------|--------|---------------------------|---------------|---------------|--------|-------------------------|---------------|---------------------------------|-----------------------------|
|                                                                                                                                                                                                                                                                                                                             |                                          |                       |                               | Arrow Direc   | Symbol  | Text                      | Detail Number | Arrow Direc   | Symbol | Text                      | Detail Number | Arrow Direc   | Symbol | Text                      | Detail Number | Arrow Direc   | Symbol | Text                    | Detail Number |                                 |                             |
| <div><div><div>↑</div><div>←</div><div>↙</div></div><div>- THROUGH (T)<br/>- LEFT (L)<br/>- DIAGONAL LEFT (DL)</div></div> <div><div>↖</div><div>→</div><div>↗</div></div> <div>-ADVANCE TURN ARROW<br/>"THROUGH-LEFT" (TL)<br/>- RIGHT (R)<br/>- DIAGONAL RIGHT (DR)<br/>ADVANCE TURN ARROW<br/>"THROUGH-RIGHT" (TR)</div> |                                          |                       |                               |               |         |                           |               |               |        |                           |               |               |        |                           |               |               |        |                         |               |                                 |                             |
| B76                                                                                                                                                                                                                                                                                                                         | 31st St and Lancer Dr                    | NW                    | Bike Route                    | T             | Bicycle |                           | 1/6           |               |        |                           |               |               |        |                           |               |               |        |                         |               | 13                              |                             |
| B77                                                                                                                                                                                                                                                                                                                         | 31st Ave and Nicholson St                | S                     | Destination                   | L             |         | NW Branch Trail           | 1/2/3         | R             |        | Ed. Felegy ES             | 1/2/3         | R             |        | Nich. Orem MS             | 1/2/3         | R             |        | Mall at Prince George's | 1/2/3         | 28                              |                             |
| B78                                                                                                                                                                                                                                                                                                                         | Nicholson St and 31st Ave                | NE                    | Destination                   | T             |         | NW Branch Trail           | 1/2/3         | T             |        | Heurich Park              | 1/2/3         | L             |        | Queens Chapel Town Center | 1/2/3         |               |        |                         |               | 28                              |                             |
| B79                                                                                                                                                                                                                                                                                                                         | Nicholson St and 31st Ave                | SW                    | Destination with Metro Symbol | R             |         | Queens Chapel Town Center | 1/2/3         | R             | Metro  | W Hyattsville             | 1/2/4         | R             |        | Gateway Arts Dist         | 1/2/3         |               |        |                         |               | 28                              |                             |
| B80                                                                                                                                                                                                                                                                                                                         | Nicholson St and Heurich Park Rd         | NE                    | Destination                   | R             |         | Heurich Park              | 1/2/3         | R             |        | NW Branch Trail           | 1/2/3         |               |        |                           |               |               |        |                         |               | 13                              |                             |
| B81                                                                                                                                                                                                                                                                                                                         | Heurich Park Rd and Nicholson St         | NW                    | Destination with Metro Symbol | L             |         | Queens Chapel Town Center | 1/2/3         | L             | Metro  | W Hyattsville             | 1/2/4         | L             |        | Gateway Arts Dist         | 1/2/3         |               |        |                         |               | 28                              |                             |
| B82                                                                                                                                                                                                                                                                                                                         | Heurich Park Parking Lot                 | S                     | Destination                   | DL            |         | Heurich Park              | 1/2/3         | L             |        | NW Branch Trail           | 1/2/3         |               |        |                           |               |               |        |                         |               | 13                              |                             |
| B83                                                                                                                                                                                                                                                                                                                         | Nicholson St and 33rd Ave                | NW                    | Destination                   | T             |         | Gateway Arts Dist         | 1/2/3         | L             |        | Nich. Orem MS             | 1/2/3         |               |        |                           |               |               |        |                         |               | 13                              |                             |
| B84                                                                                                                                                                                                                                                                                                                         | Nicholson St and 33rd Ave                | SE                    | Destination                   | T             |         | NW Branch Trail           | 1/2/3         | T             |        | Heurich Park              | 1/2/3         | R             |        | Nich. Orem MS             | 1/2/3         |               |        |                         |               | 28                              |                             |
| B85                                                                                                                                                                                                                                                                                                                         | Nicholson St and Jamestown Rd            | NW                    | Destination with Metro Symbol | L             | Metro   | Pr George's Pl Via Stairs | 1/2/4         | R             |        | Queens Chapel Town Center | 1/2/3         | R             |        | Gateway Arts Dist         | 1/2/3         |               |        |                         |               | 28                              |                             |
| B86                                                                                                                                                                                                                                                                                                                         | Jamestown Rd and Nicholson St            | NE                    | Destination                   | T             |         | Queens Chapel Town Center | 1/2/3         | T             |        | Gateway Arts Dist         | 1/2/3         | R             |        | NW Branch Trail           | 1/2/3         |               |        |                         |               | 28                              |                             |
| B87                                                                                                                                                                                                                                                                                                                         | Oliver St and Jamestown Rd               | S                     | Destination with Metro Symbol | T             | Metro   | Pr George's Pl Use Stairs | 1/2/4         |               |        |                           |               |               |        |                           |               |               |        |                         |               | 13                              | Note: Back to back with B88 |
| B88                                                                                                                                                                                                                                                                                                                         | Oliver St and Jamestown Rd               | N                     | Destination                   | T             |         | Queens Chapel Town Center | 1/2/3         | T             |        | Gateway Arts Dist         | 1/2/3         |               |        |                           |               |               |        |                         |               | 13                              | Note: Back to back with B87 |



Vehicle Wayfinding Sign Reference Guide

| Sign Point                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Intersection- See KML for Exact Location  | Sign Face Orientation | Destination 1 |         |                                  |          | Destination 2 |        |                                       |          | Destination 3 |        |                     |          | Notes                                                                                                                                                                                                                                           | Text Block Height (Inches) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------|---------------|---------|----------------------------------|----------|---------------|--------|---------------------------------------|----------|---------------|--------|---------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           |                       | Arrow Direc   | Symbol  | Text                             | Detail # | Arrow Direc   | Symbol | Text                                  | Detail # | Arrow Direc   | Symbol | Text                | Detail # |                                                                                                                                                                                                                                                 |                            |
| <div><div><div><div><div></div></div><div>- THROUGH (T)</div></div><div><div><div></div></div><div>- LEFT (L)</div></div><div><div><div></div></div><div>- DIAGONAL LEFT (DL)</div></div></div><div><div><div><div></div></div><div>-ADVANCE TURN ARROW "THROUGH-LEFT" (TL)</div></div><div><div><div></div></div><div>- RIGHT (R)</div></div><div><div><div></div></div><div>- DIAGONAL RIGHT (DR)</div></div><div><div><div></div></div><div>ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)</div></div></div></div> |                                           |                       |               |         |                                  |          |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 |                            |
| C1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Belcrest Rd and Toledo Rd                 | S                     | R             | Parking |                                  | 7/11     |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 16                         |
| C2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Belcrest Rd and Liberty Ln/Freedom Wy     | N                     | T             | Metro   | Pr George's Pl                   | 7/8/10   | L             |        | Univ Town Center                      | 7/8/9    | R             |        | Mall at Pr George's | 7/8/9    |                                                                                                                                                                                                                                                 | 24                         |
| C3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Ln/Freedom Wy                             | S                     | R             |         | Univ Town Center                 | 7/8/9    | R             |        | Parking                               | 7/8/9    |               |        |                     |          |                                                                                                                                                                                                                                                 | 16                         |
| C4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Queensbury Rd and Queens Chapel Rd        | E                     | T             | Metro   | Pr George's Pl                   | 7/8/10   |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 8                          |
| C5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Queensbury Rd and Queens Chapel Rd        | E                     | T             | Metro   | Pr George's Pl                   | 7/8/10   |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 8                          |
| C6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Oglethorpe st and 42nd Ave                | NW                    | T             |         | Hyattsville MS                   | 7/8/9    |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 8                          |
| C7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 42nd Ave and Oglethorpe St                | S                     | R             |         | Hyattsville MS                   | 7/8/9    |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 8                          |
| C8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Baltimore Ave at the limit of Hyattsville | S                     | T             |         | Univ of Maryland                 | 7/8/9    | T             |        | Mall at Pr George's Via East West Hwy | 7/8/9    |               |        |                     |          |                                                                                                                                                                                                                                                 | 24                         |
| C9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Baltimore Ave and Jefferson St            | N                     | R             |         | Hyattsville ES                   | 7/8/9    | R             | Metro  | W Hyattsville                         | 7/8/10   |               |        |                     |          |                                                                                                                                                                                                                                                 | 16                         |
| C10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Baltimore Ave and Jefferson St            | S                     | L             |         | Hyattsville ES                   | 7/8/9    | L             | Metro  | W Hyattsville                         | 7/8/10   |               |        |                     |          |                                                                                                                                                                                                                                                 | 16                         |
| C11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Jefferson St and Baltimore Ave            | W                     | T             | Parking |                                  | 7/11     |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 16                         |
| C12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Jefferson St and 43rd Ave                 | E                     | L             |         | Hyattsville ES                   | 7/8/9    |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 8                          |
| C13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Jefferson St and 43rd Ave                 | W                     | R             |         | Hyattsville ES                   | 7/8/9    |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 8                          |
| C14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd Pl and Jefferson St                  | S                     | R             |         | Hyattsville ES                   | 7/8/9    | R             |        | Parking                               | 7/8/9    |               |        |                     |          |                                                                                                                                                                                                                                                 | 16                         |
| C15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Jefferson St and 40th St                  | E                     | L             |         | Magruder Park                    | 7/8/9    |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 8                          |
| C16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Baltimore Ave and Gallatin St             | N                     | R             |         | Municipal Bldg                   | 7/8/9    | R             |        | Parking Lot 3                         | 7/8/9    | R             | Metro  | W Hyattsville       | 7/8/10   |                                                                                                                                                                                                                                                 | 24                         |
| C17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Baltimore Ave and Gallatin St             | S                     | L             |         | Municipal Bldg                   | 7/8/9    | L             |        | Parking Lot 3                         | 7/8/9    | L             | Metro  | W Hyattsville       | 7/8/10   |                                                                                                                                                                                                                                                 | 24                         |
| C18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Baltimore Ave and Farragut St             | N                     | T             |         | Public Parking at Justice Center | 7/8/9    |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 16                         |
| C19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Gallatin St and 42nd Pl                   | E                     | R             |         | Hyattsville ES                   | 7/8/9    |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 8                          |
| C20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Gallatin St and 42nd Ave                  | E                     | R             |         | Queens Chapel Town Center        | 7/8/9    | R             | Metro  | W Hyattsville                         | 7/8/10   |               |        |                     |          |                                                                                                                                                                                                                                                 | 24                         |
| C21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 42nd Ave and Hamilton St                  | S                     | L             |         | Magruder Park                    | 7/8/9    | L             |        | Queens Chapel Town Center             | 7/8/9    | L             | Metro  | W Hyattsville       | 7/8/10   |                                                                                                                                                                                                                                                 | 24                         |
| C22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Hamilton St and 39th Ave                  | NE                    | DR            | Metro   | W Hyattsville                    | 7/8/10   |               |        |                                       |          |               |        |                     |          | Before installation, relocate existing stop signs into the existing curb extensions. May need to place sign after the intersection on Hamilton if it is obscuring the stop signs. In that case, change the directional arrow to plain "Through" | 8                          |
| C23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 40th Ave and Hamilton St                  | N                     | T             |         | Magruder Park                    | 7/8/9    | T             |        | Parking                               | 7/8/9    |               |        |                     |          |                                                                                                                                                                                                                                                 | 16                         |
| C24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Hamilton St and 40th Ave                  | W                     | R             |         | Magruder Park                    | 7/8/9    | R             |        | Parking                               | 7/8/9    |               |        |                     |          |                                                                                                                                                                                                                                                 | 16                         |
| C25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Jefferson St and Hamilton St              | NE                    | R             | Metro   | W Hyattsville                    | 7/8/10   |               |        |                                       |          |               |        |                     |          |                                                                                                                                                                                                                                                 | 8                          |

Vehicle Wayfinding Sign Reference Guide

| Sign Point                                                                                                                                                                                                                                                                                                                                                                                                                             | Intersection- See KML for Exact Location | Sign Face Orientation | Destination 1 |         |                   |          | Destination 2 |        |                     |          | Destination 3 |        |      |          | Notes | Text Block Height (Inches) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------|---------------|---------|-------------------|----------|---------------|--------|---------------------|----------|---------------|--------|------|----------|-------|----------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                          |                       | Arrow Direc   | Symbol  | Text              | Detail # | Arrow Direc   | Symbol | Text                | Detail # | Arrow Direc   | Symbol | Text | Detail # |       |                            |
| <div><div><div>↑</div><div>- THROUGH (T)</div></div><div><div>←</div><div>- LEFT (L)</div></div><div><div>↙</div><div>- DIAGONAL LEFT (DL)</div></div></div> <div><div><div>↖</div><div>-ADVANCE TURN ARROW<br/>"THROUGH-LEFT" (TL)</div></div><div><div>→</div><div>- RIGHT (R)</div></div><div><div>↗</div><div>- DIAGONAL RIGHT (DR)</div></div><div><div>↘</div><div>ADVANCE TURN ARROW<br/>"THROUGH-RIGHT" (TR)</div></div></div> |                                          |                       |               |         |                   |          |               |        |                     |          |               |        |      |          |       |                            |
| C26                                                                                                                                                                                                                                                                                                                                                                                                                                    | Hamilton St and Jefferson St             | W                     | L             |         | Gateway Arts Dist | 7/8/9    | T             |        | Magruder Park       | 7/8/9    |               |        |      |          |       | 16                         |
| C27                                                                                                                                                                                                                                                                                                                                                                                                                                    | Hamilton St and Queens Chapel Rd         | SE                    | T             | Metro   | W Hyattsville     | 7/8/10   | R             |        | Mall at Pr George's | 7/8/9    |               |        |      |          |       | 16                         |
| C28                                                                                                                                                                                                                                                                                                                                                                                                                                    | Queens Chapel Rd and Ager Rd             | NE                    | R             | Metro   | W Hyattsville     | 7/8/10   |               |        |                     |          |               |        |      |          |       | 8                          |
| C29                                                                                                                                                                                                                                                                                                                                                                                                                                    | Hamilton and 31st Ave                    | SE                    | R             | Parking |                   | 7/11     |               |        |                     |          |               |        |      |          |       | 16                         |
| C30                                                                                                                                                                                                                                                                                                                                                                                                                                    | 31st Ave N of Hamilton St                | S                     | R             | Parking |                   | 7/11     |               |        |                     |          |               |        |      |          |       | 16                         |
| C31                                                                                                                                                                                                                                                                                                                                                                                                                                    | Hamilton and 31st Ave                    | SW                    | L             | Parking |                   | 7/11     |               |        |                     |          |               |        |      |          |       | 16                         |
| C32                                                                                                                                                                                                                                                                                                                                                                                                                                    | Ager Rd and Hamilton St                  | SE                    | L             | Metro   | W Hyattsville     | 7/8/10   |               |        |                     |          |               |        |      |          |       | 8                          |

Pedestrian Wayfinding Sign Reference Guide

| Sign Point | Intersection- See KML for Exact Location | General Location            | Location Title            | Location Description                                                                                                                                                                                                                                                                                                        |
|------------|------------------------------------------|-----------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kiosk 1    | Baltimore Ave and Farragut St            | Trolley Trail Entrance      | Gateway Arts District     | Recommended placement at the southern end of the Gateway Arts District, at the entrance to the Trolley Trail. This kioks is intended to serve as a 'gateway' / welcome feature for bicyclists and pedestrians using Trolley Trail.                                                                                          |
| Kiosk 2    | Baltimore Ave and Jefferson St           | NE corner of intersection   | Gateway Arts District     | Recommended placement at the “heart” of the Gateway Arts District, identified by the City as high pedestrian traffic area.                                                                                                                                                                                                  |
| Kiosk 3    | Belcrest Rd and Liberty Lane             | East Side (UTC side)        | University Town Center    | Recommended placment is in area identified as having high pedestrian traffic in front of bus stop. It will serve as a 'gateway'/welcome feature to the University Town Center (UTC) and the Mall at Prince George's.                                                                                                        |
| Kiosk 4    | MD 410 and Metro Entrance                | In plaza next to ped bridge | Hyattsville Crossing      | Recommended location will serve as a 'gateway'/welcome feature to the City of Hyattsville via the Prince George’s Plaza Metro Station. Final location of kiosk will depend on right-of-way ownership, existing space, and other agreements with Metro/SHA. Another location north of the Metro exit may also be considered. |
| Kiosk 5    | Hamilton and 31st Ave                    | NW corner of intersection   | Queens Chapel Town Center | Recommended placement will serve as a 'gateway' feature to the Queens Chapel Town Center area for pedestrians and bicyclists coming from the West Hyattsville Metro Station.                                                                                                                                                |

Note: Kiosk signs to be installed such that the map panels are facing towards the south.

Kiosk Destination and Mileage Lists:

| Kiosk   | Destination                         | Distance (Miles) |
|---------|-------------------------------------|------------------|
| Kiosk 1 | Municipal Complex                   | 0.1              |
|         | Heritage Center                     | 0.1              |
|         | Historic District                   | 0.3              |
|         | Hyattsville Elementary School       | 0.3              |
|         | Northwest Branch Trail              | 0.5              |
|         | Magruder Park                       | 0.7              |
|         | Hyattsville Middle School           | 0.8              |
| Kiosk 2 | Hyattsville Elementary School       | 0.1              |
|         | Trolley Trail                       | 0.1              |
|         | Heritage Center                     | 0.2              |
|         | Municipal Complex                   | 0.3              |
|         | Historic District                   | 0.4              |
|         | Hyattsville Middle School           | 0.6              |
|         | Northwest Branch Trail              | 0.7              |
| Kiosk 3 | Magruder Park                       | 0.8              |
|         | Mall at Prince George's             | 0.1              |
|         | Hyattsville Crossing                | 0.2              |
|         | Prince George's Plaza Metro Station | 0.2              |
|         | Hyattsville Branch Library          | 0.3              |
|         | Northwestern High School            | 0.6              |
|         | Nicholas Orem Middle School         | 0.6              |
| Kiosk 4 | Edward M. Felegy Elementary School  | 0.7              |
|         | Mall at Prince George's             | 0.1              |
|         | Prince George's Plaza Metro Station | 0.1              |
|         | University Town Center              | 0.2              |
|         | Nicholas Orem Middle School         | 0.4              |
|         | Hyattsville Branch Library          | 0.5              |
|         | Edward M. Felegy Elementary School  | 0.5              |
| Kiosk 5 | Hyattsville Middle School           | 0.9              |
|         | Heurich Park                        | 1.2              |
|         | West Hyattsville Metro Station      | 0.3              |
|         | Northwest Branch Trail              | 0.3              |
|         | Nicholas Orem Middle School         | 0.8              |
|         | Heurich Park                        | 0.9              |

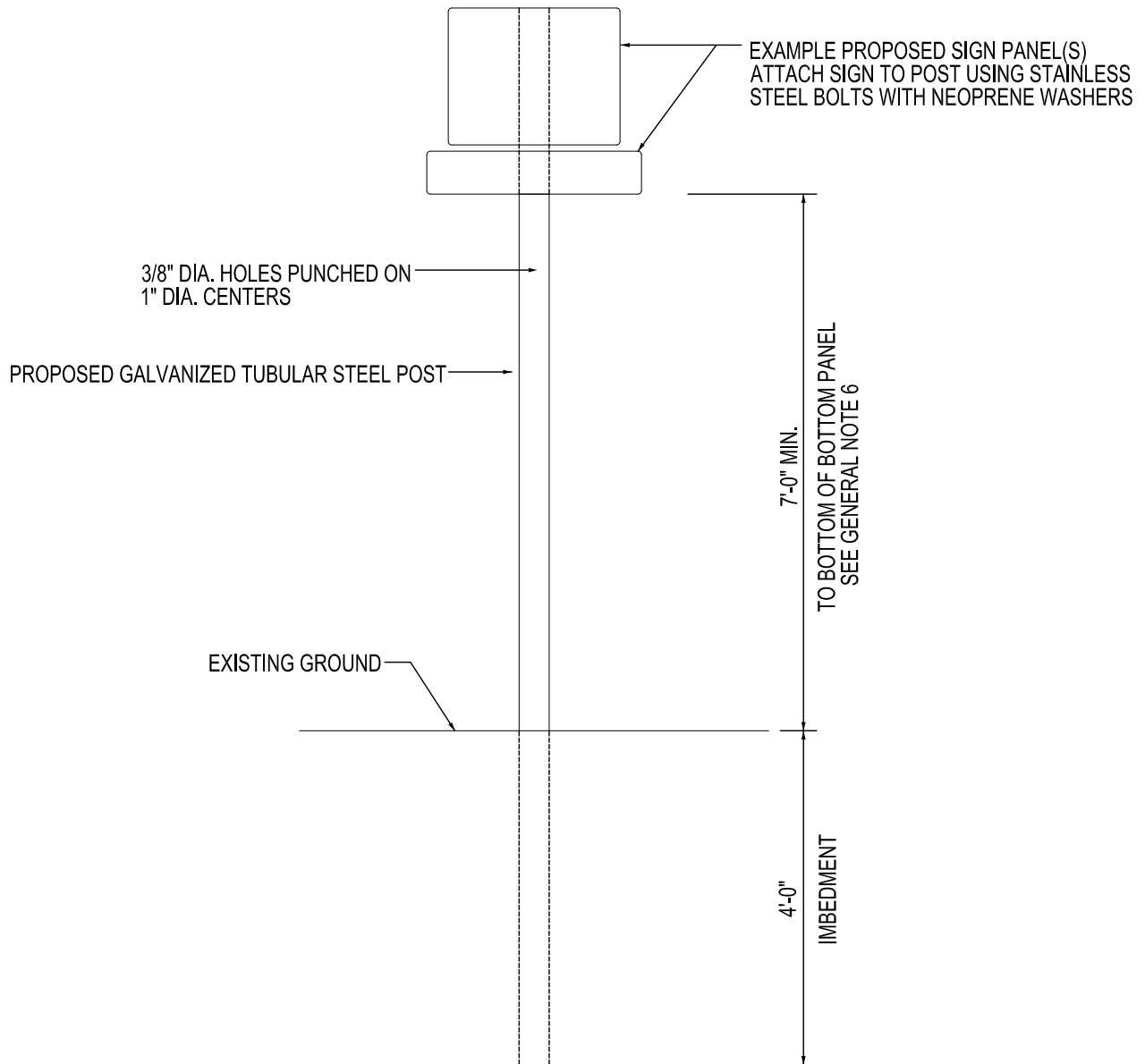
## **GENERAL NOTES**

1. All work shall meet all applicable Prince George's County Department of Public Works and Transportation (DPW&T) latest standards and specifications. Work shall also meet all applicable requirements of the Manual of Uniform Traffic Control Devices (MUTCD).
2. Sign locations were developed based on information from Google Earth and field visits to key intersections. The Contractor shall verify all dimensions in the field prior to installing proposed work. When these plans are in conflict with actual site conditions, proposed work may be adjusted as directed by the City of Hyattsville (City). Costs are incidental to the appropriate pay items.
3. All sign panels shown are proposed unless otherwise noted.
4. All signs shall be high intensity sheeting meeting the requirements of AASHTO M268
5. Lateral clearance between proposed sign posts and edge of adjacent roadway shall be in accordance with Prince George's County DPW&T and MUTCD standards and specifications. In general, signs shall have a lateral offset of 2 feet from face of curb. In urban settings where space is restricted, signs shall have a lateral offset of 1 foot from face of curb. When installing sign posts adjacent to or within an existing sidewalk, a minimum clear width of 32" on the existing sidewalk shall be maintained, and a preferred clear width of 48" shall be maintained where feasible.
6. All signs shall have a minimum vertical clearance of 7 feet from the ground to the bottom of the sign. If the Contractor cannot meet the 7-foot clearance on an existing sign post, the Contractor shall extend the sign post and install both proposed and existing signs in order to meet the vertical clearance. All signs that are installed on existing traffic structures such as signal pole, light poles, etc. shall have the 7-foot minimum clearance from the ground to the bottom of the sign panel. If at any point the Contractor cannot meet the vertical clearance required, the Contractor shall contact the City for further instructions prior to installation of the sign in question.
7. Proposed sign panels for bicyclists shall be mounted so they are visible by a bicyclist at a minimum of 80 feet. Proposed sign panels for motor vehicle operators shall be mounted so they are visible by the operator at a minimum of 180 feet. Contractor shall bring any needed vegetation trimming or other obstructions to the attention of the City.
8. Proposed signs at new locations shall be installed so they do not block the visibility of any existing signs or signals and so they do not block sight lines at intersections, driveways, and bicycle and pedestrian crossings.
9. Proposed signs and posts shall be clear of existing fire hydrants, surface utility, and overhead utility equipment a minimum of 10 feet. If this clearance cannot be met, the Contractor shall contact the City for further instructions prior to installation.
10. For new post installation, the Contractor shall verify that there are no conflicting underground or overhead utilities, and shall call Miss Utility before beginning installations.

11. Square steel sign post installation, sign panel mounting and hardware shall be in accordance with MDSHA standards and specifications. Signs shall be mounted on proposed square steel metal posts unless otherwise noted in the plans. See sheets 3-6 for mounting details.
12. All signs shall be securely fastened so as to hold the sign in a permanent position and resist movement by the wind or displacement by vandals.
13. The Contractor shall submit proofs/shop drawings of the proposed sign content to the City for approval prior to fabrication and installation.
14. At the direction and approval of the City, sign panels to be mounted on new posts may be mounted on appropriate existing posts if available.
15. Signs mounted to existing light, signal or utility poles shall be fastened with a manufactured steel banding system. Poles shall not be drilled directly. The Contractor shall submit manufacturer information on the banding system to the City for approval prior to installation.
16. If sign installation is shown on a pole that is not owned by the City, written permission must be obtained from the owner (utility company, SHA, or property owner). The Contractor is responsible for obtaining required permission.
17. Existing signs (panels, hardware and/or posts) that are called for to be removed and not reused shall be disposed of.
18. All sign locations shown on the plans are schematic and may not reflect actual field locations. The Contractor shall verify each location prior to installing a sign. If at any point the Contractor finds a conflict, the Contractor shall contact the City prior to installing the proposed sign.
19. The Contractor shall verify all dimensions in the field prior to installing signing. Additional adjustments of existing signs beyond those called for in these plans may be necessary, as directed by the City.
20. The Contractor shall mark all sign locations in the field for City of Hyattsville to review prior to installation.

ELEVATION

# PROPOSED POST AND SIGN INSTALLATION DETAIL



NOTE:

1. SIGN IS ASSOCIATED WITH SIGNAGE PLANS. SEE SIGN REFERENCE GUIDE, KMLS, DETAILS, AND GENERAL NOTES FOR SIGN LOCATIONS, PANEL, POST AND MOUNTING DETAIL.

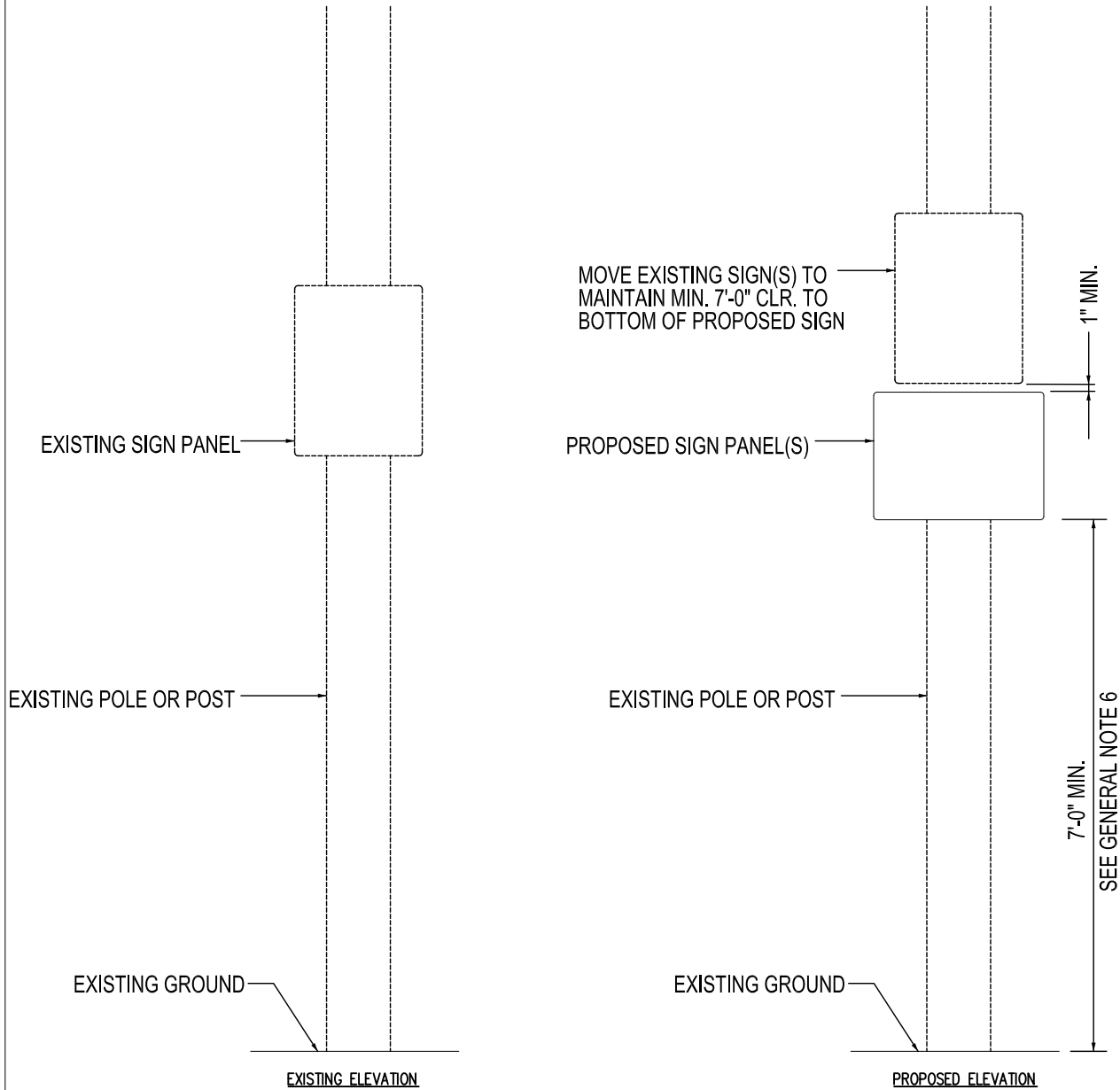
## GENERAL NOTES

HYATTSTVILLE WAYFINDING  
SIGN TYPICAL DETAIL - 1  
PROPOSED MOUNTING OF SIGNS

SHEET 3 OF 6  
N.T.S.

ELEVATION

# EXAMPLE MOUNTING DETAIL BELOW AN EXISTING SIGN



**NOTE:**

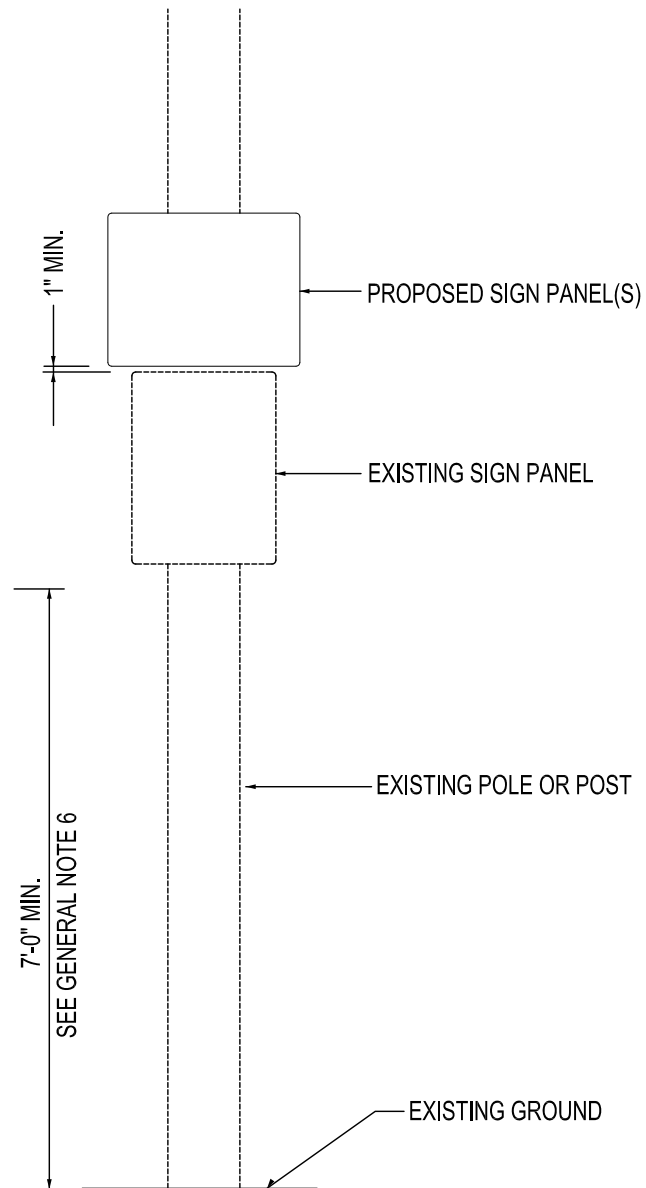
1. SIGN IS ASSOCIATED WITH SIGNAGE PLANS. SEE SIGN REFERENCE GUIDE, DETAILS, AND GENERAL NOTES FOR SIGN LOCATIONS, PANEL, POST AND MOUNTING DETAIL.

## GENERAL NOTES

HYATTSVILLE WAYFINDING  
SIGN TYPICAL DETAIL - 2  
MOUNTING BELOW EXISTING SIGNS

SHEET 4 OF 6  
N.T.S.

# ELEVATION EXAMPLE MOUNTING DETAIL ABOVE AN EXISTING SIGN



NOTE:  
1. SIGN IS ASSOCIATED WITH SIGNAGE PLANS. SEE SIGN REFERENCE GUIDE, KMLS, DETAILS, AND GENERAL NOTES FOR SIGN LOCATIONS, PANEL, POST AND MOUNTING DETAIL.

**GENERAL NOTES**  
HYATTSVILLE WAYFINDING  
SIGN TYPICAL DETAIL - 3  
MOUNTING ABOVE EXISTING SIGNS

SHEET 5 OF 6  
N.T.S.



ELEVATION

PROPOSED TUBULAR  
STEEL POST

DRILL HOLE 2" LARGER THAN  
POST ON ALL SIDES, INSTALL  
POST, FILL VOID WITH  
CONCRETE (SEE NOTE 2)

EXISTING SIDEWALK

EXAMPLE PROPOSED SIGN PANEL(S)  
ATTACH SIGN TO POST USING STAINLESS  
STEEL BOLTS WITH NEOPRENE WASHERS

TO BOTTOM OF BOTTOM PANEL  
SEE GENERAL NOTE 6

CLEAR SIDEWALK SPACE  
32" MINIMUM  
48" PREFERRED

2" TYP.

2'-6"

NOTE:  
1. SIGN IS ASSOCIATED WITH SIGNAGE PLANS. SEE SIGN REFERENCE GUIDE, KMLS,  
DETAILS, AND GENERAL NOTES FOR SIGN LOCATIONS, PANEL, POST AND MOUNTING  
DETAIL.

## GENERAL NOTES

898

SHEET 6 OF 6  
N.T.S.

# WAYFINDING SIGNAGE FABRICATION DETAILS

- 1. BICYCLE WAYFINDING SIGN FABRICATION DETAILS: SHEETS 2-5
- 2. VEHICLE WAYFINDING SIGN FABRICATION DETAILS: SHEETS 6-8
- 3. PEDESTRIAN KIOSK SIGN FABRICATION DETAILS: SHEETS 9-10



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HYATTSVILLE WAYFINDING  
FABRICATION DETAILS  
HYATTSVILLE, MD

PREPARED: CB  
CHECKED: MMG

DATE  
8/3/18

REV. 1 -  
REV. 2 -  
REV. 3 -

SHEET NAME  
COVER SHEET  
SIGN DETAILS

DRAWING NUMBER  
C-1

SHEET NUMBER  
1 OF 10



HYATTSVILLE WAYFINDING  
FABRICATION DETAILS  
HYATTSVILLE, MD

PREPARED: CB  
CHECKED: MMG

DATE  
8/3/18

REV. 1 -  
REV. 2 -  
REV. 3 -

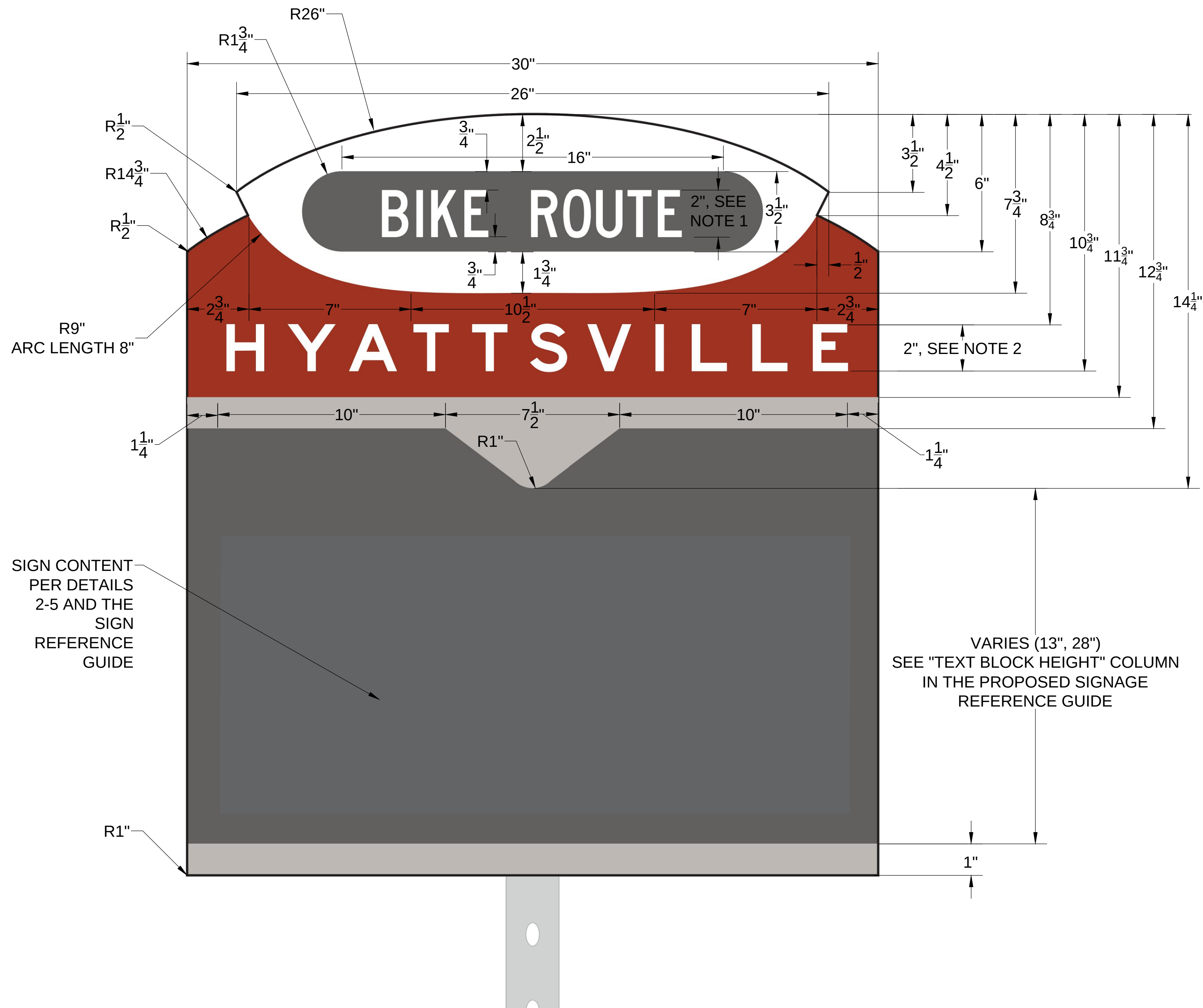
SHEET NAME  
BICYCLE WAYFINDING  
DETAILS

DRAWING NUMBER

**B-1**

SHEET NUMBER

**2** OF **10**



DETAIL 1: BICYCLE WAYFINDING SIGN EXTERIOR LAYOUT

N.T.S.

- NOTES:
1. FONT: HIGHWAY GOTHIC SERIES C  
COLOR: WHITE
  2. FONT: HIGHWAY GOTHIC SERIES E  
COLOR: WHITE
  3. SIGN COLORS AS SHOWN:  
WHITE (R255, G255, B255)  
LIGHT GRAY (R189, G196, B191)  
DARK GRAY (R81, G92, B92)  
RED (R151, G18, B4)
  4. EACH BICYCLE WAYFINDING SIGN TO BE INSTALLED ON A  
SQUARE STEEL POST
  5. DETAIL 1 APPLIES TO ALL BICYCLE WAYFINDING SIGNAGE
  6. SEE SHEETS B-2 THROUGH B-4 AND THE BICYCLE WAYFINDING  
SIGN REFERENCE GUIDE FOR CONTENT FOR EACH SIGN





DETAIL 2: BICYCLE WAYFINDING "DESTINATION" SIGN TYPE  
VERTICAL LAYOUT ALIGNMENT  
N.T.S.

- NOTES:
1. FONT: HIGHWAY GOTHIC SERIES C  
COLOR: WHITE
  2. SIGN COLORS AS SHOWN:  
WHITE (R255, G255, B255)  
LIGHT GRAY (R189, G196, B191)  
DARK GRAY (R81, G92, B92)  
RED (R151, G18, B4)
  3. EACH BICYCLE WAYFINDING SIGN TO BE  
INSTALLED ON A SQUARE STEEL POST
  4. WHITE DOTTED LINES ARE INTENDED TO BE  
USED AS GUIDE LINES ONLY AND ARE NOT TO  
BE PRINTED.
  5. DETAIL 2 APPLIES TO ALL VARIATIONS OF  
BICYCLE "DESTINATION" SIGN TYPES.

ARROW LAYOUT GUIDE

ARROWS TO BE PLACED IN 3"X3" DOTTED BOX,  
CENTERED HORIZONTALLY AND VERTICALLY  
(DOTTED BOX IS A GUIDE AND NOT TO BE PRINTED)

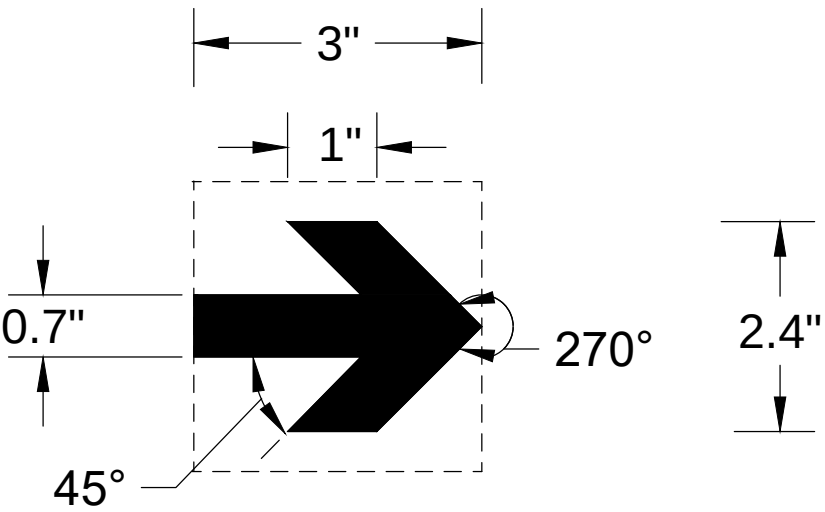
ARROW OPTIONS  
PLACED TO THE RIGHT OF TEXT/SYMBOL

- - RIGHT (R)
- ↗ - DIAGONAL RIGHT (DR)
- ↘ - THROUGH RIGHT (TR)

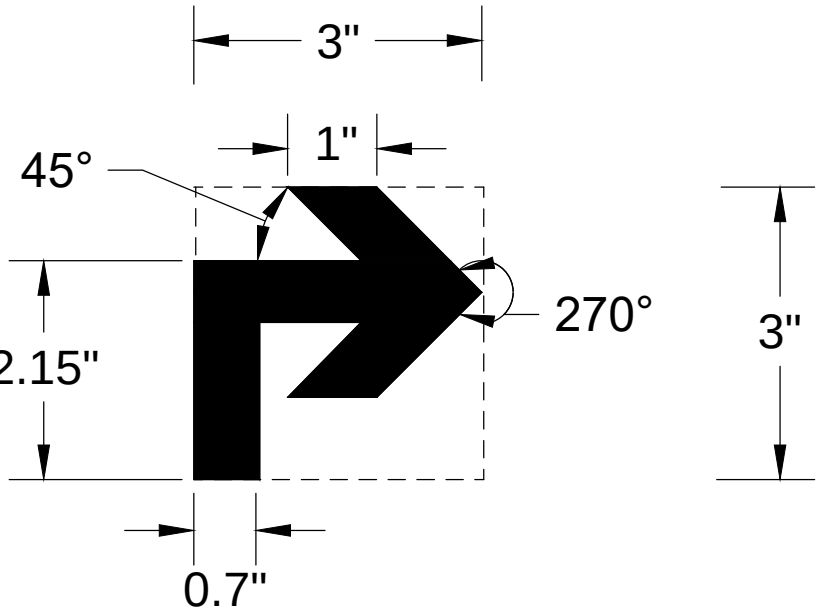
ARROW OPTIONS  
PLACED TO THE LEFT OF TEXT

- ← - THROUGH (T)
- ↖ - LEFT (L)
- ↙ - DIAGONAL LEFT (DL)
- ↗ - THROUGH LEFT (TL)

LEFT/RIGHT, STRAIGHT,  
DIAGONAL LEFT/RIGHT  
ARROW



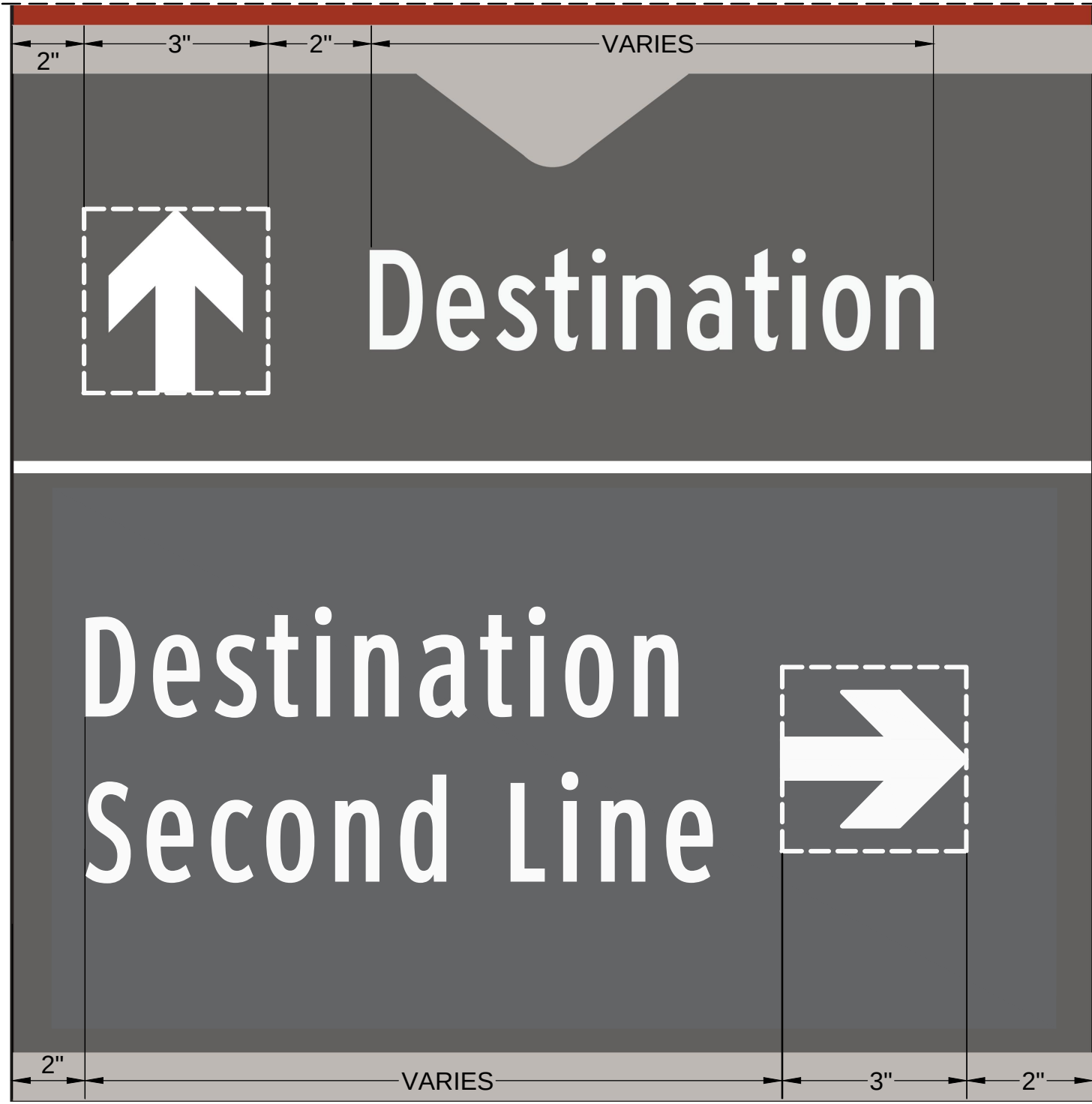
THROUGH LEFT/THROUGH RIGHT ARROW



HYATTSVILLE WAYFINDING  
FABRICATION DETAILS  
HYATTSVILLE, MD

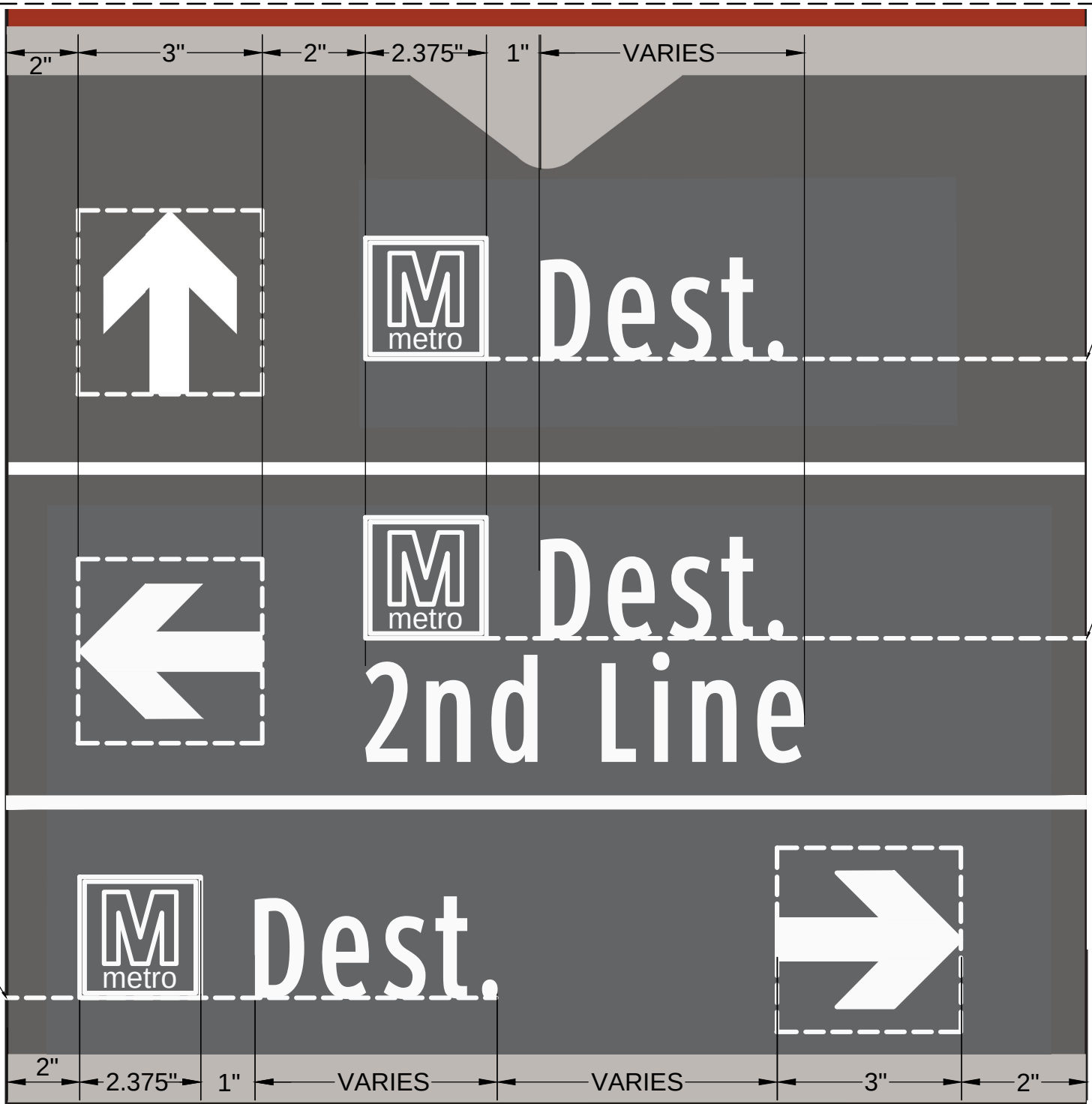
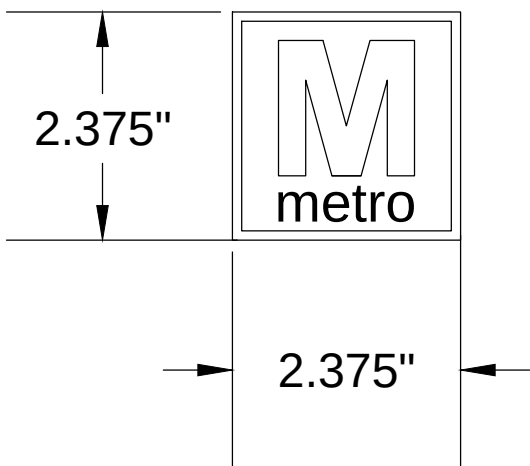
PREPARED: CB  
CHECKED: MMG  
DATE  
8/3/18  
REV. 1 -  
REV. 2 -  
REV. 3 -  
SHEET NAME  
BICYCLE WAYFINDING  
DETAILS  
DRAWING NUMBER  
B-2  
SHEET NUMBER  
3 OF 10





DETAIL 3: BICYCLE WAYFINDING "DESTINATION" SIGN TYPE  
HORIZONTAL LAYOUT ALIGNMENT  
N.T.S.

METRO SYMBOL



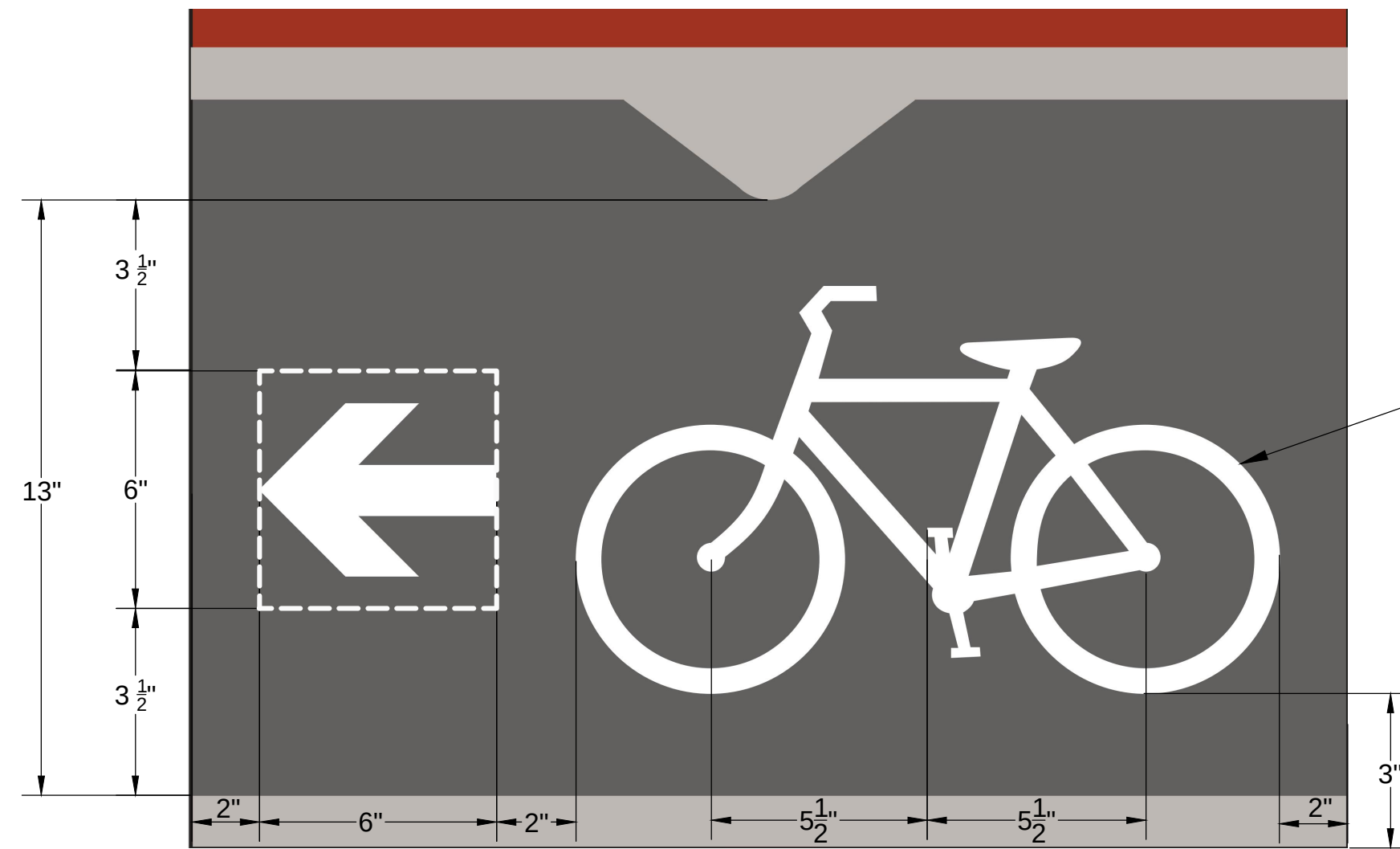
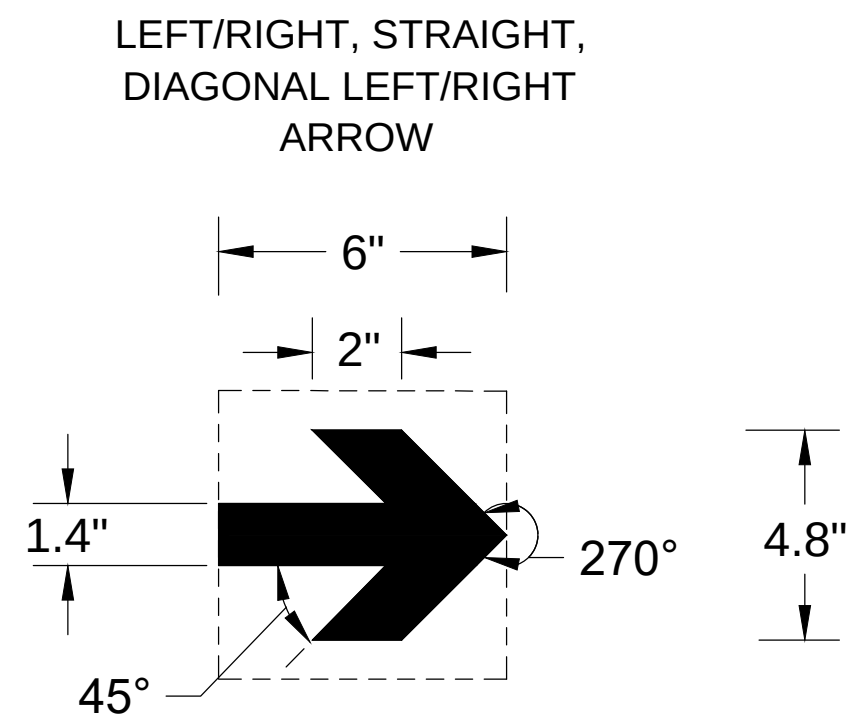
DETAIL 4: BICYCLE WAYFINDING "DESTINATION" SIGN TYPE  
FOR DESTINATIONS WITH A METRO SYMBOL  
HORIZONTAL LAYOUT ALIGNMENT  
N.T.S.



DETAIL 5: BICYCLE WAYFINDING "DESTINATION" SIGN TYPE  
FOR DESTINATIONS WITH TWO DIRECTIONAL ARROWS  
HORIZONTAL LAYOUT ALIGNMENT  
N.T.S.

- NOTES:
1. SEE SHEET B-2 FOR VERTICAL LAYOUT OF ALL "DESTINATION" SIGN TYPES
  2. SEE SHEET B-2 FOR FONT AND SYMBOL DETAILS
  3. SIGN COLORS AS SHOWN:  
WHITE (R255, G255, B255)  
LIGHT GRAY (R189, G196, B191)  
DARK GRAY (R81, G92, B92)  
RED (R151, G18, B4)
  4. EACH BICYCLE WAYFINDING SIGN TO BE INSTALLED ON A SQUARE STEEL POST
  5. DOTTED WHITE LINES ARE INTENDED TO BE USED AS GUIDE LINES ONLY AND ARE NOT TO BE PRINTED.
  6. HORIZONTAL LAYOUT ALIGNMENTS SHOWN IN DETAILS 3-5 APPLY TO BICYCLE WAYFINDING "DESTINATION" SIGN TYPES. DETAIL 3 APPLIES TO REGULAR DESTINATIONS. DETAIL 4 APPLIES TO DESTINATIONS THAT INCLUDE A METRO SYMBOL. DETAIL 5 APPLIES TO DESTINATIONS THAT REQUIRE TWO DIRECTIONAL ARROWS. SEE BICYCLE WAYFINDING SIGN REFERENCE GUIDE FOR WHICH DETAIL APPLIES TO WHICH DESTINATIONS.
  7. SEE DETAIL 1 ON SHEET B-1 FOR OVERALL SIGN SHAPE AND DETAIL.



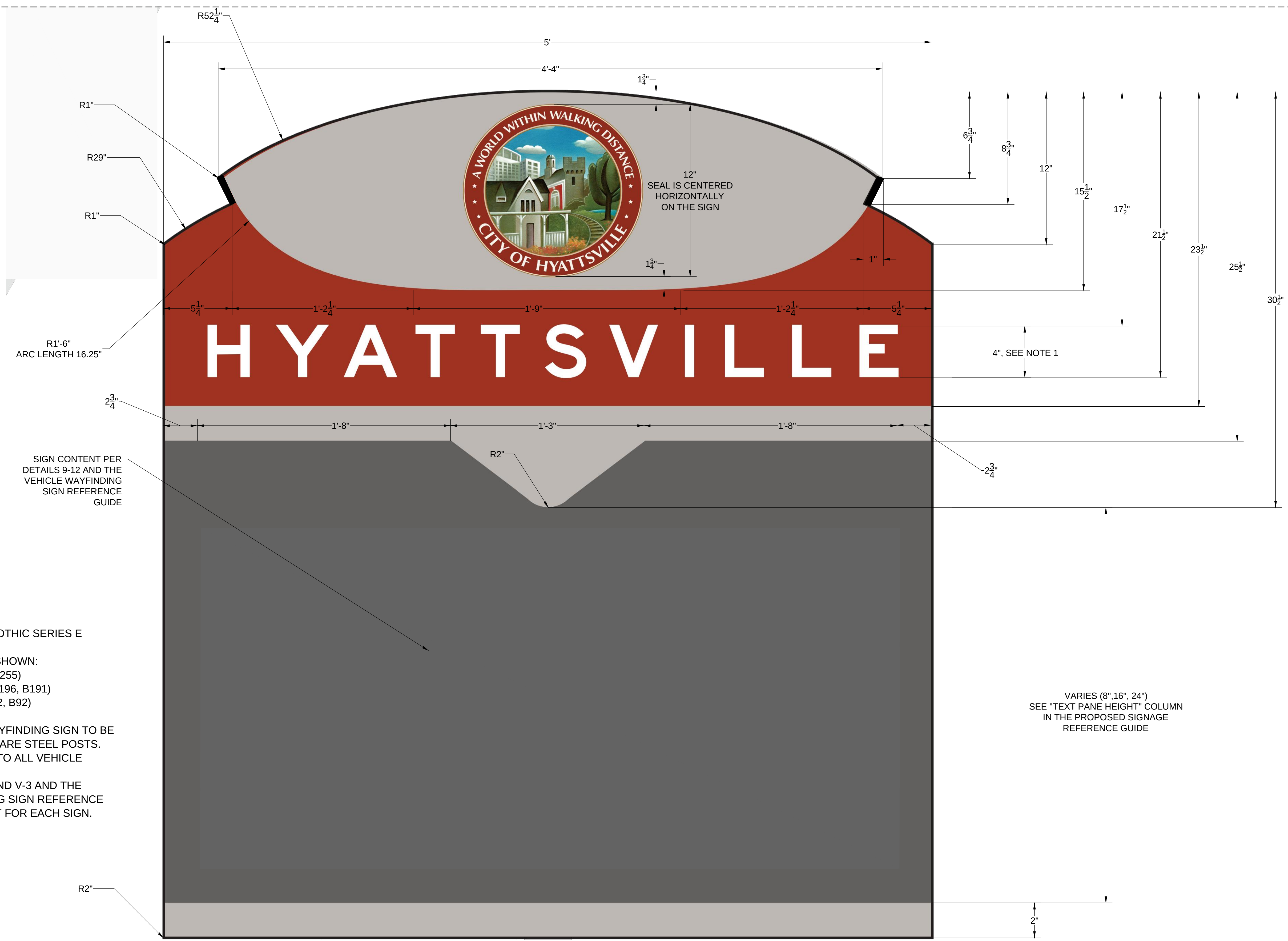


STANDARD MUTCD BICYCLE SYMBOL.  
SEE 2004 STANDARD HIGHWAY SIGNS GUIDE,  
APPENDIX, SHEET 6-7

DETAIL 6: BICYCLE WAYFINDING "BIKE ROUTE" SIGN TYPE  
HORIZONTAL AND VERTICAL LAYOUT ALIGNMENTS  
N.T.S.

- NOTES:
- 1. SIGN COLORS AS SHOWN:  
WHITE (R255, G255, B255)  
LIGHT GRAY (R189, G196, B191)  
DARK GRAY (R81, G92, B92)  
RED (R151, G18, B4)
  - 2. DOTTED WHITE LINES ARE INTENDED TO BE USED AS GUIDE LINES ONLY AND ARE NOT TO BE PRINTED
  - 3. EACH BICYCLE WAYFINDING SIGN TO BE INSTALLED ON A SQUARE STEEL POST
  - 4. DETAIL 6 APPLIES TO BICYCLE WAYFINDING "BIKE ROUTE" SIGN TYPES. SEE BICYCLE WAYFINDING SIGN REFERENCE GUIDE FOR MORE DETAILS.
  - 5. SEE DETAIL 1 ON SHEET B-1 FOR OVERALL SIGN SHAPE AND DIMENSIONS.





- NOTES:
- 1. FONT: HIGHWAY GOTHIC SERIES E  
COLOR: WHITE
  - 3. SIGN COLORS AS SHOWN:  
WHITE (R255, G255, B255)  
LIGHT GRAY (R189, G196, B191)  
DARK GRAY (R81, G92, B92)  
RED (R151, G18, B4)
  - 4. EACH VEHICLE WAYFINDING SIGN TO BE  
INSTALLED ON 2 SQUARE STEEL POSTS.
  - 5. DETAIL 7 APPLIES TO ALL VEHICLE  
WAYFINDING SIGNS.
  - 6. SEE SHEETS V-2 AND V-3 AND THE  
VEHICLE WAYFINDING SIGN REFERENCE  
GUIDE FOR CONTENT FOR EACH SIGN.

DETAIL 7: VEHICLE WAYFINDING SIGN EXTERIOR LAYOUT  
N.T.S.

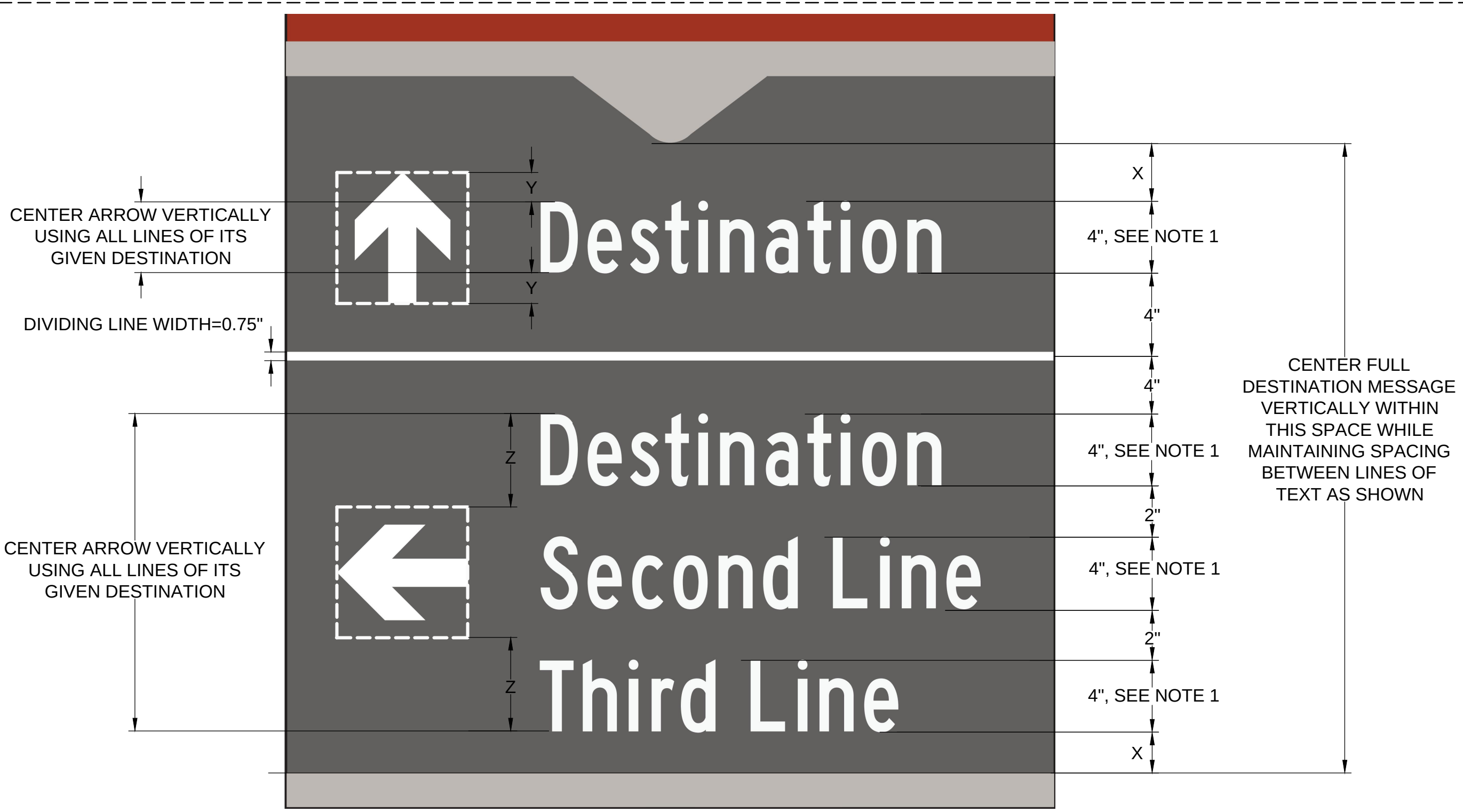


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HYATTSVILLE, MD

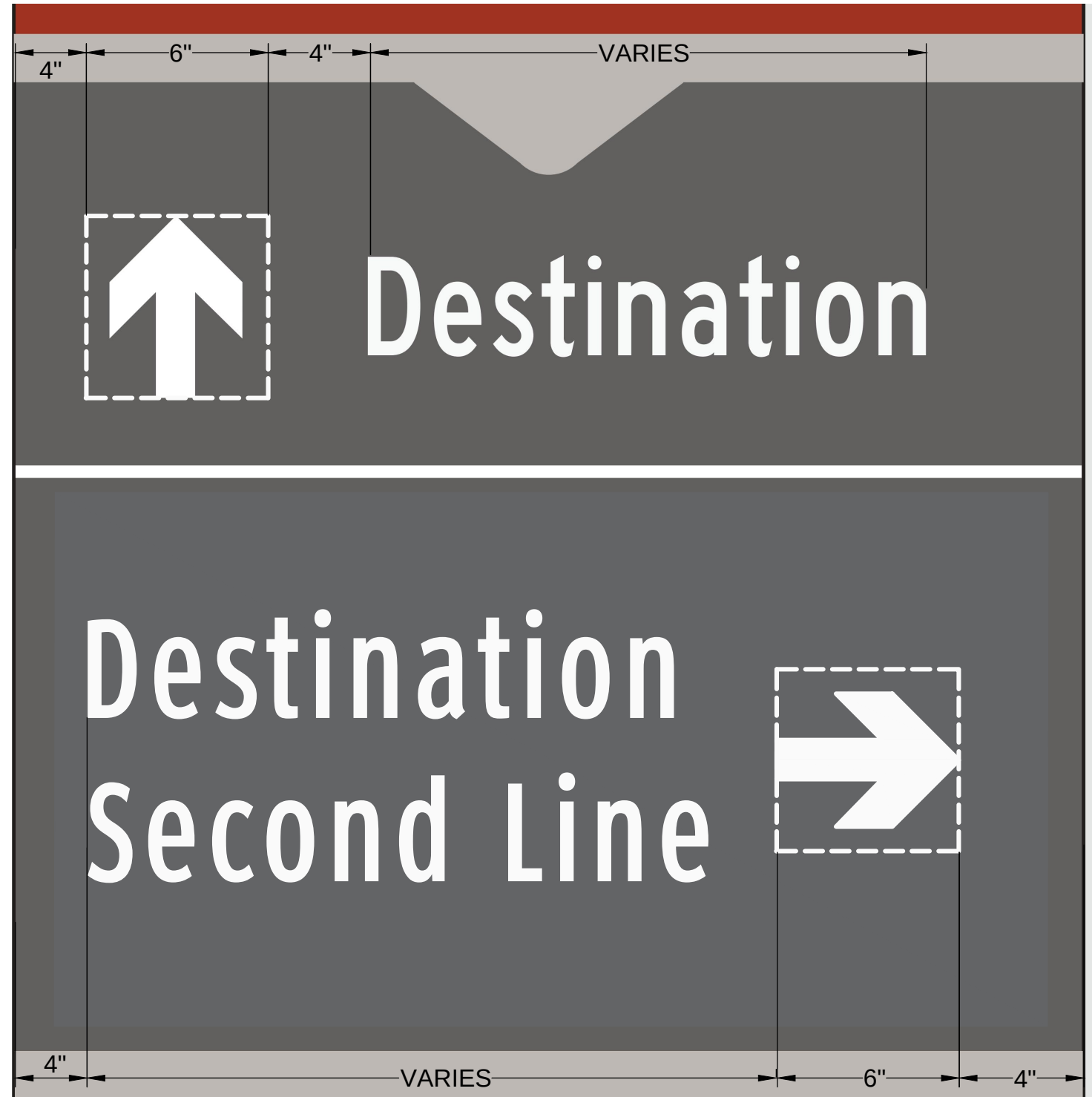
PREPARED: CB  
CHECKED: MMG  
DATE  
8/3/18  
REV. 1 -  
REV. 2 -  
REV. 3 -  
SHEET NAME  
VEHICLE  
WAYFINDING  
DETAILS  
DRAWING NUMBER  
V-1  
SHEET NUMBER  
6 OF 10





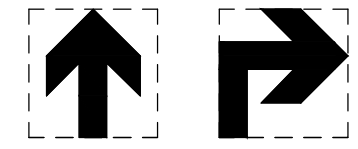
DETAIL 8: VEHICLE WAYFINDING SIGN  
VERTICAL LAYOUT ALIGNMENT  
N.T.S.

- NOTES:
1. FONT: HIGHWAY GOTHIC SERIES C  
COLOR: WHITE
  2. SIGN COLORS AS SHOWN:  
WHITE (R255, G255, B255)  
LIGHT GRAY (R189, G196, B191)  
DARK GRAY (R81, G92, B92)  
RED (R151, G18, B4)
  3. EACH VEHICLE WAYFINDING SIGN TO BE  
INSTALLED ON 2 SQUARE METAL POSTS.
  4. DOTTED WHITE LINES ARE INTENDED TO BE  
USED AS GUIDE LINES ONLY AND ARE NOT TO  
BE PRINTED.
  5. DETAIL 8- VERTICAL LAYOUT APPLIES TO  
ALL VEHICLE WAYFINDING SIGN  
DESTINATIONS EXCEPT THOSE WITH A  
PARKING SYMBOL INCLUDED. SEE VEHICLE  
WAYFINDING GUIDE FOR WHICH  
DESTINATIONS APPLY.
  6. HORIZONTAL LAYOUT ALIGNMENTS SHOWN  
IN DETAILS 9-10 APPLY TO DIFFERENT  
VEHICLE WAYFINDING SIGN DESTINATIONS.  
DETAIL 9 APPLIES TO ALL DESTINATIONS THAT  
HAVE NO SYMBOL. DETAIL 10 APPLIES TO  
DESTINATIONS THAT INCLUDE A METRO  
SYMBOL. SEE VEHICLE WAYFINDING SIGN  
REFERENCE GUIDE FOR WHICH DETAIL  
APPLIES TO WHICH DESTINATIONS.
  7. SEE DETAIL 7 ON SHEET V-1 FOR OVERALL  
SIGN SHAPE AND DIMENSIONS FOR ALL SIGNS.



DETAIL 9: VEHICLE WAYFINDING SIGN  
HORIZONTAL LAYOUT ALIGNMENT  
N.T.S.

ARROW LAYOUT GUIDE



ARROWS TO BE PLACED IN 6"X6" DOTTED BOX,  
CENTERED HORIZONTALLY AND VERTICALLY  
(DOTTED BOX IS A GUIDE AND NOT TO BE PRINTED)

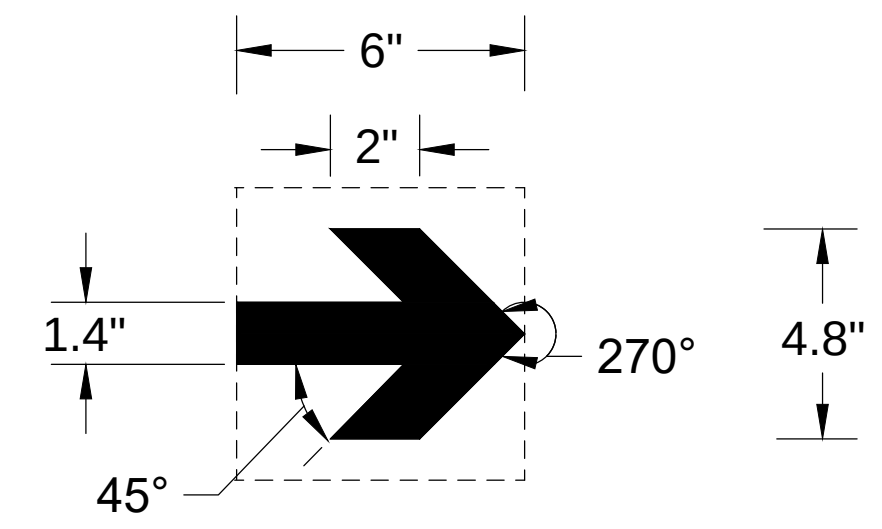
ARROW OPTIONS  
PLACED TO THE RIGHT OF TEXT/SYMBOL

- ➡ - RIGHT (R)
- ↗ - DIAGONAL RIGHT (DR)
- ➡ - THROUGH RIGHT (TR)

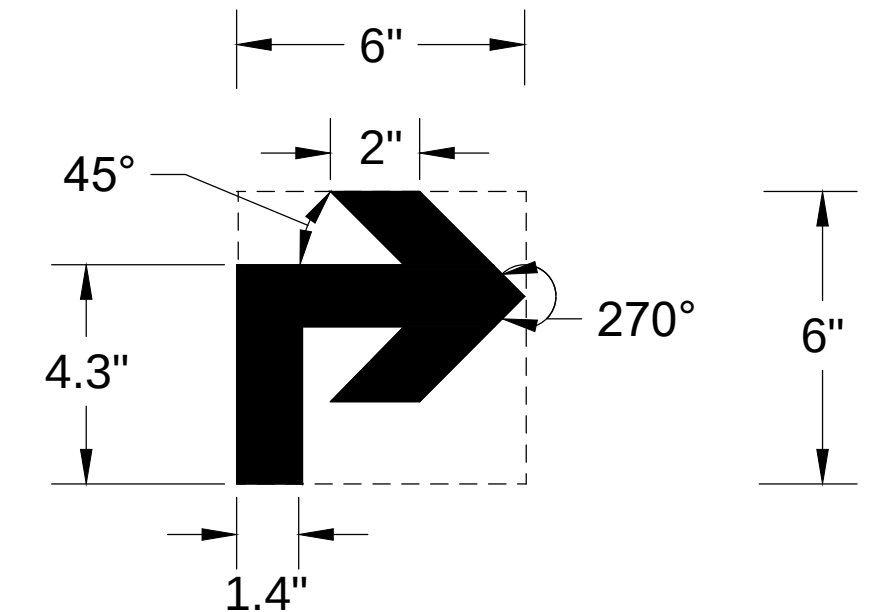
ARROW OPTIONS  
PLACED TO THE LEFT OF TEXT

- ↖ - THROUGH (T)
- ↖ - LEFT (L)
- ↖ - DIAGONAL LEFT (DL)
- ↖ - THROUGH LEFT (TL)

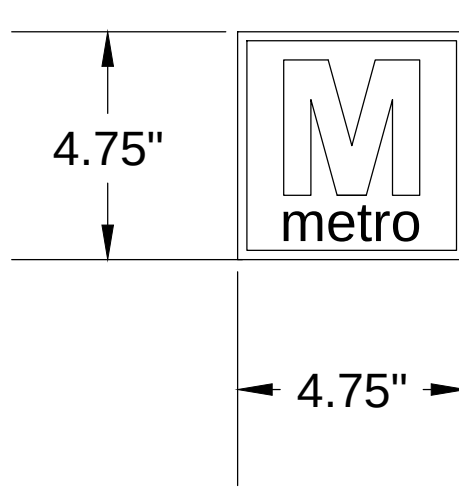
LEFT/RIGHT, STRAIGHT,  
DIAGONAL LEFT/RIGHT  
ARROW



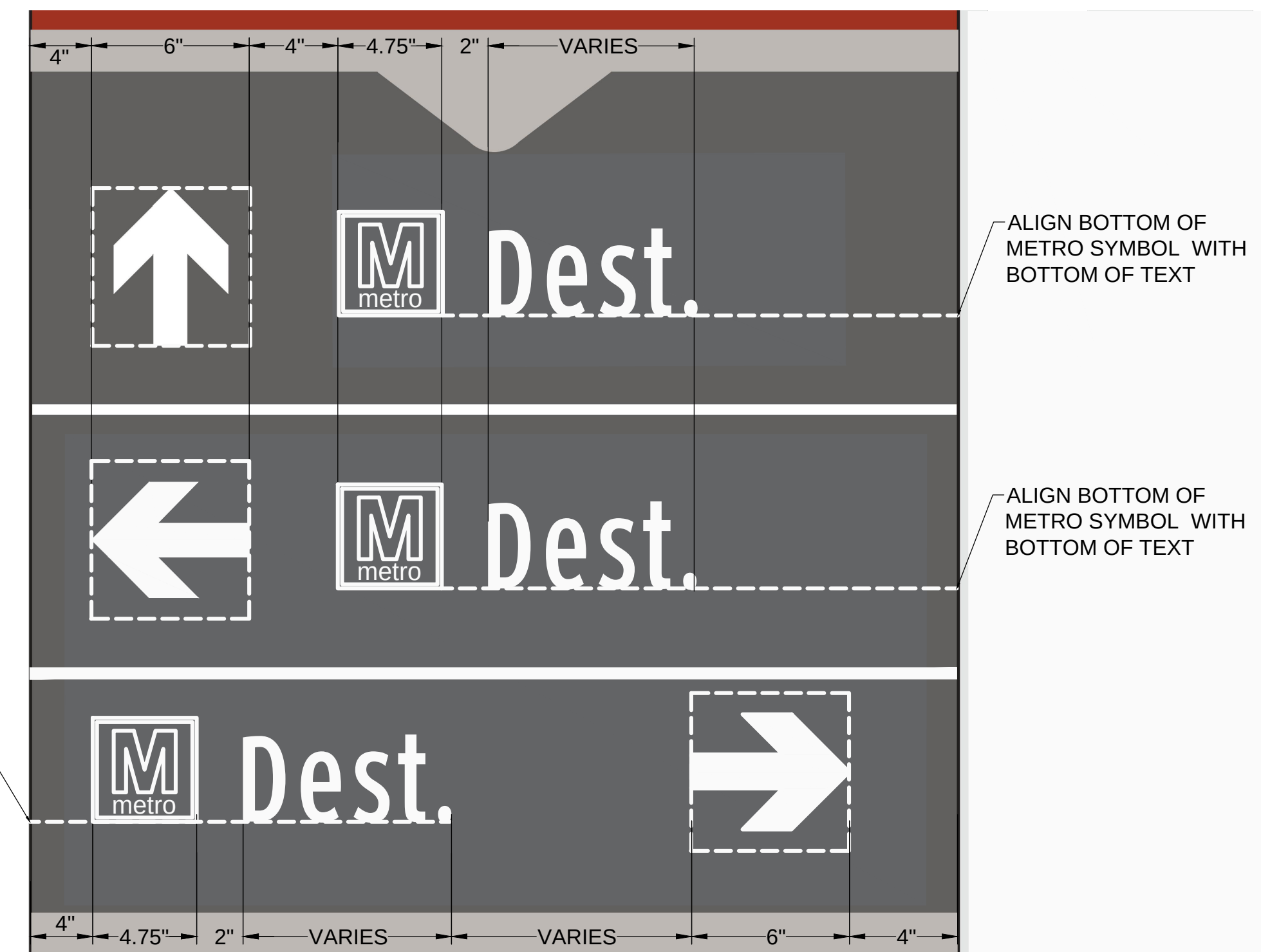
THROUGH LEFT/THROUGH RIGHT ARROW



METRO SYMBOL



ALIGN BOTTOM OF  
METRO SYMBOL WITH  
BOTTOM OF TEXT

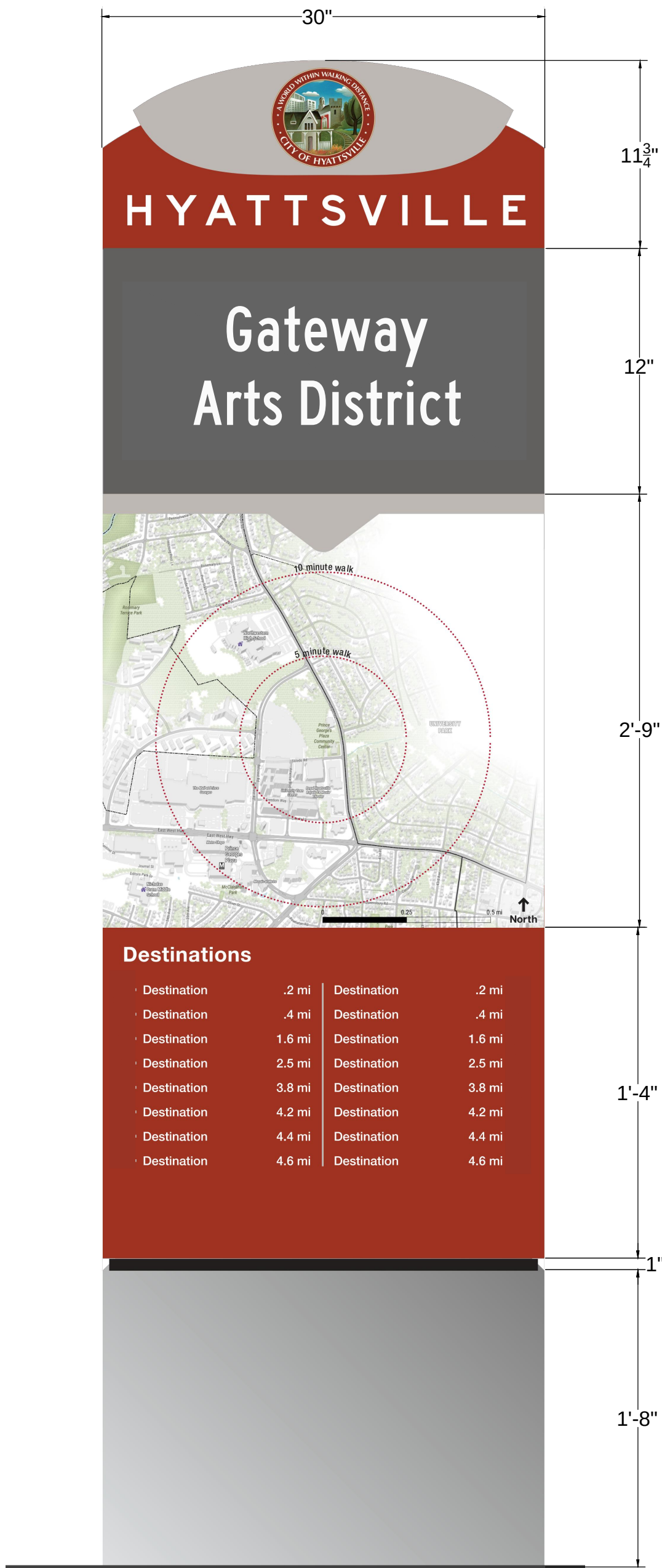


DETAIL 10: VEHICLE WAYFINDING SIGN  
WHEN A METRO SYMBOL IS INCLUDED  
HORIZONTAL LAYOUT ALIGNMENT  
N.T.S.



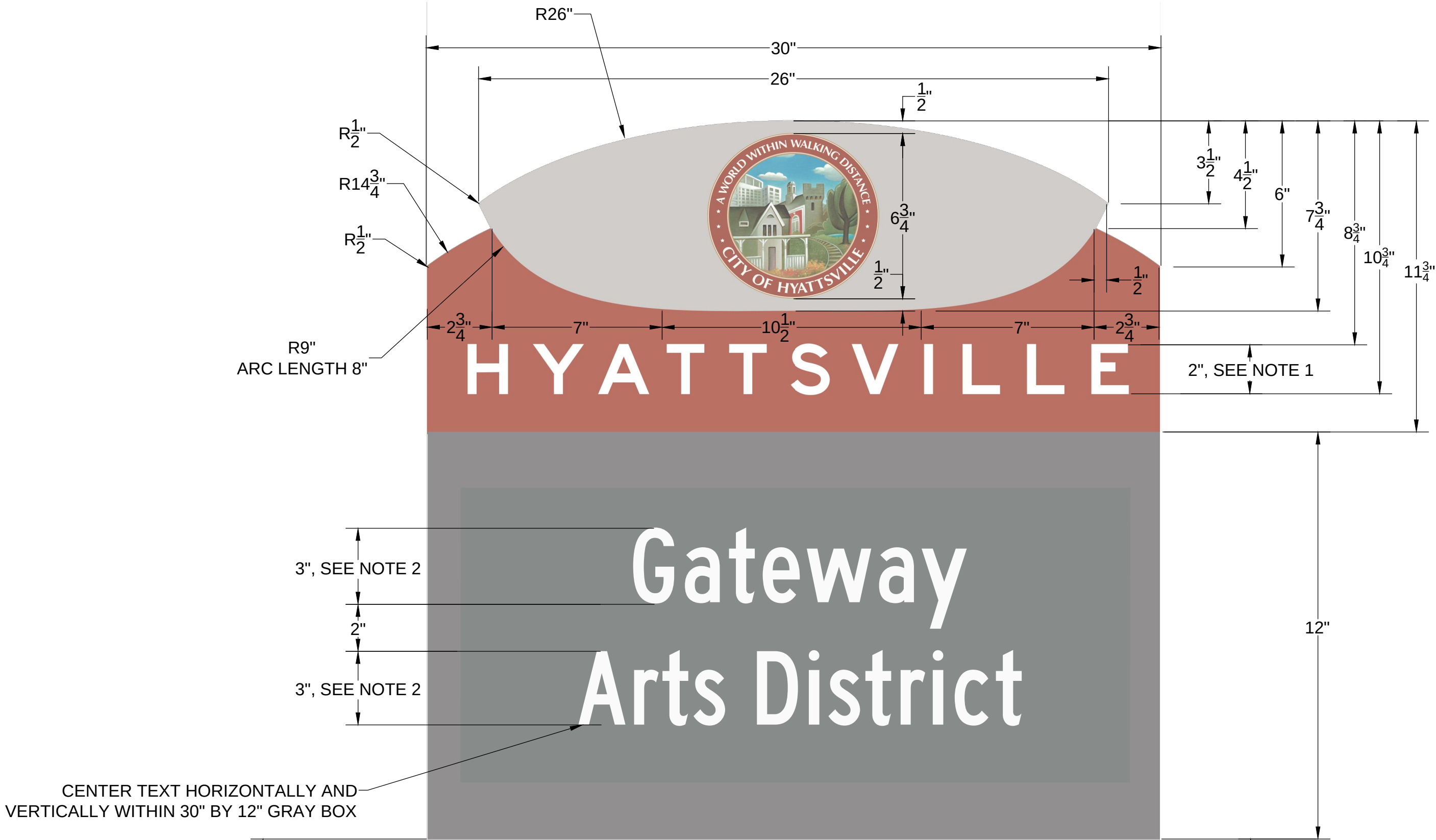




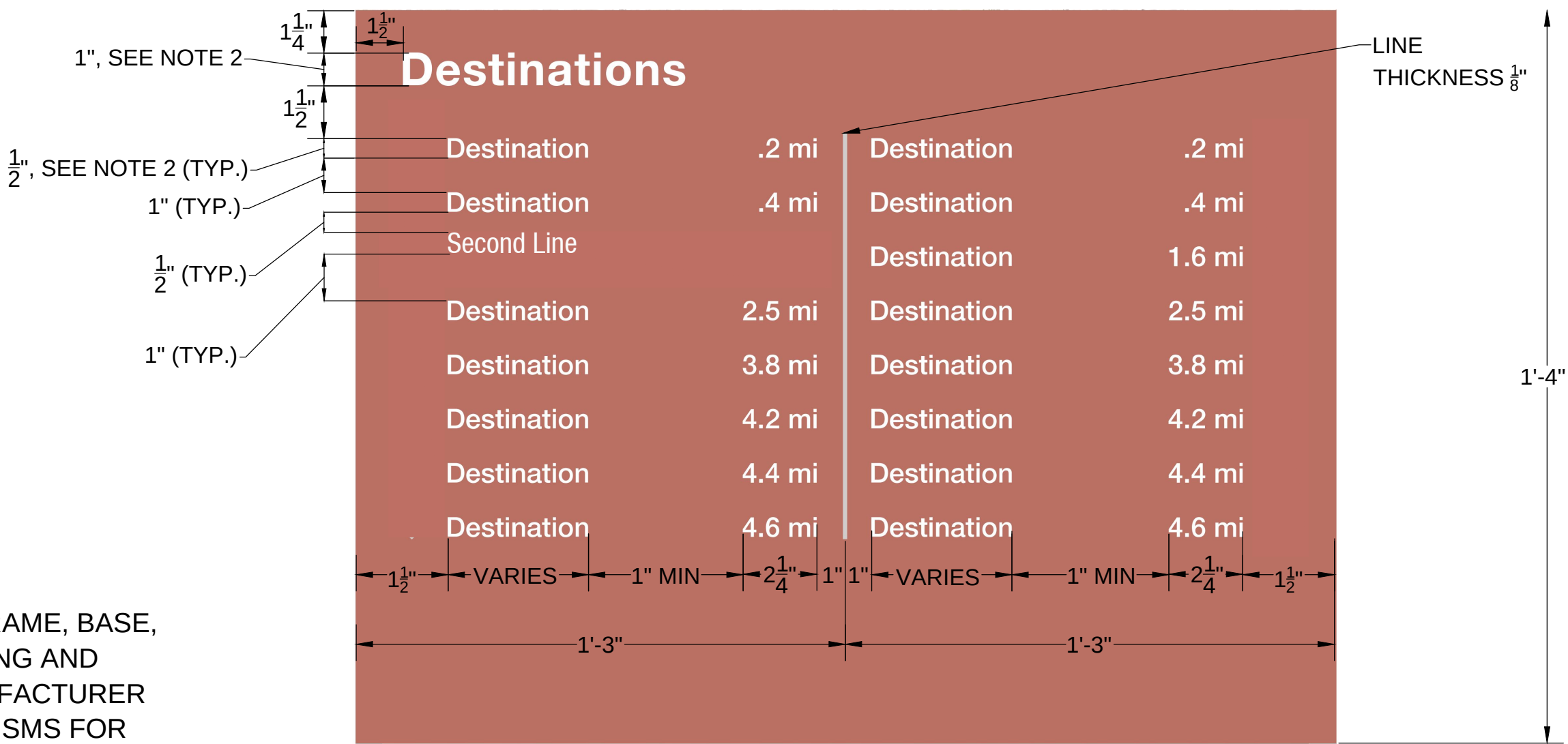


DETAIL 12: PEDESTRIAN KIOSK SIGN  
FULL LENGTH LAYOUT  
N.T.S.

- NOTES:
1. FONT: HIGHWAY GOTHIC SERIES E. COLOR: WHITE
  2. FONT: HIGHWAY GOTHIC SERIES C. COLOR: WHITE
  3. SIGN COLOR CODES: WHITE (255, 255, 255); LIGHT GRAY (R189, G196, B191); DARK GRAY (R81, G92, B92); RED (R151, G18, B4)
  4. PEDESTRIAN KIOSK TO CONSIST OF AN ALUMINUM FRAME MOUNTED ON A CONCRETE BASE, WITH EXTERIOR ALUMINUM PANELS. FRAME, BASE, ANCHOR BOLTS, AND PANEL FASTENERS TO BE MANUFACTURED AND ASSEMBLED TO WITHSTAND NORMAL EAST COAST WIND LOADING AND APPROPRIATE STRUCTURAL LOADING. ALUMINUM PANELS TO BE SECURELY FASTENED SO AS TO RESIST MOVEMENT BY WIND. MANUFACTURER TO SUBMIT SHOP DRAWINGS TO CITY OF HYATTSVILLE PRIOR TO FABRICATION, DETAILING FRAME, BASE, AND ATTACHMENT MECHANISMS FOR SECURING THE PANELS TO THE FRAME, AND SECURING THE FRAME TO THE BASE. SHOP DRAWINGS TO BE STAMPED BY STRUCTURAL ENGINEER REGISTERED IN THE STATE OF MARYLAND.
  5. ALL PANELS, (TOP PANEL, MAP PANEL, DESTINATION DIRECTORY PANEL, BOTH SIDE PANELS AND BACK PANEL) TO BE ALUMINUM SHEETS PRINTED WITH A POWDER COAT. DESTINATION DIRECTORY PANEL AND MAP PANEL TO BE EASILY REMOVEABLE AND REPLACEABLE. MANUFACTURER TO SUBMIT SAMPLES OF ALUMINUM PANELS TO THE CITY OF HYATTSVILLE FOR COLOR AND FINISH APPROVAL FOR ALL COLORS.
  6. FOR UNIQUE MAP FOR EACH KIOSK, REFER TO SIGN REFERENCE GUIDE AND FIVE ACCOMPANYING MAP IMAGE FILES.
  7. TWO SIDE PANELS AND BACK PANEL TO BE FINISHED WITH DARK GRAY POWDER COAT, SEE NOTE 3 ABOVE.

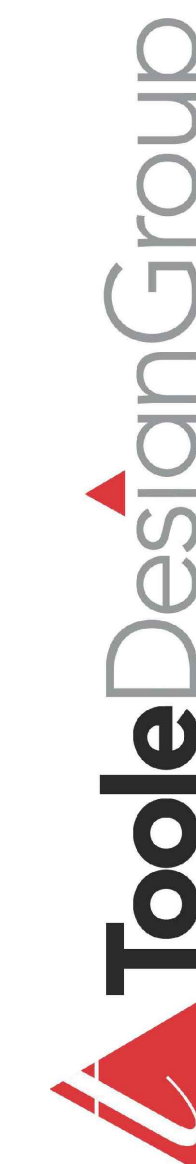


DETAIL 13: PEDESTRIAN KIOSK SIGN  
TOP PANEL AND TEXT PANEL LAYOUT  
N.T.S.



DETAIL 14: PEDESTRIAN KIOSK SIGN  
DESTINATIONS PANEL LAYOUT  
N.T.S.





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HYATTSVILLE WAYFINDING  
FABRICATION DETAILS  
HYATTSVILLE, MD

PREPARED: CB  
CHECKED: MMG

DATE  
8/3/18

|        |   |
|--------|---|
| REV 1  | - |
| REV. 2 | - |
| REV. 3 | - |

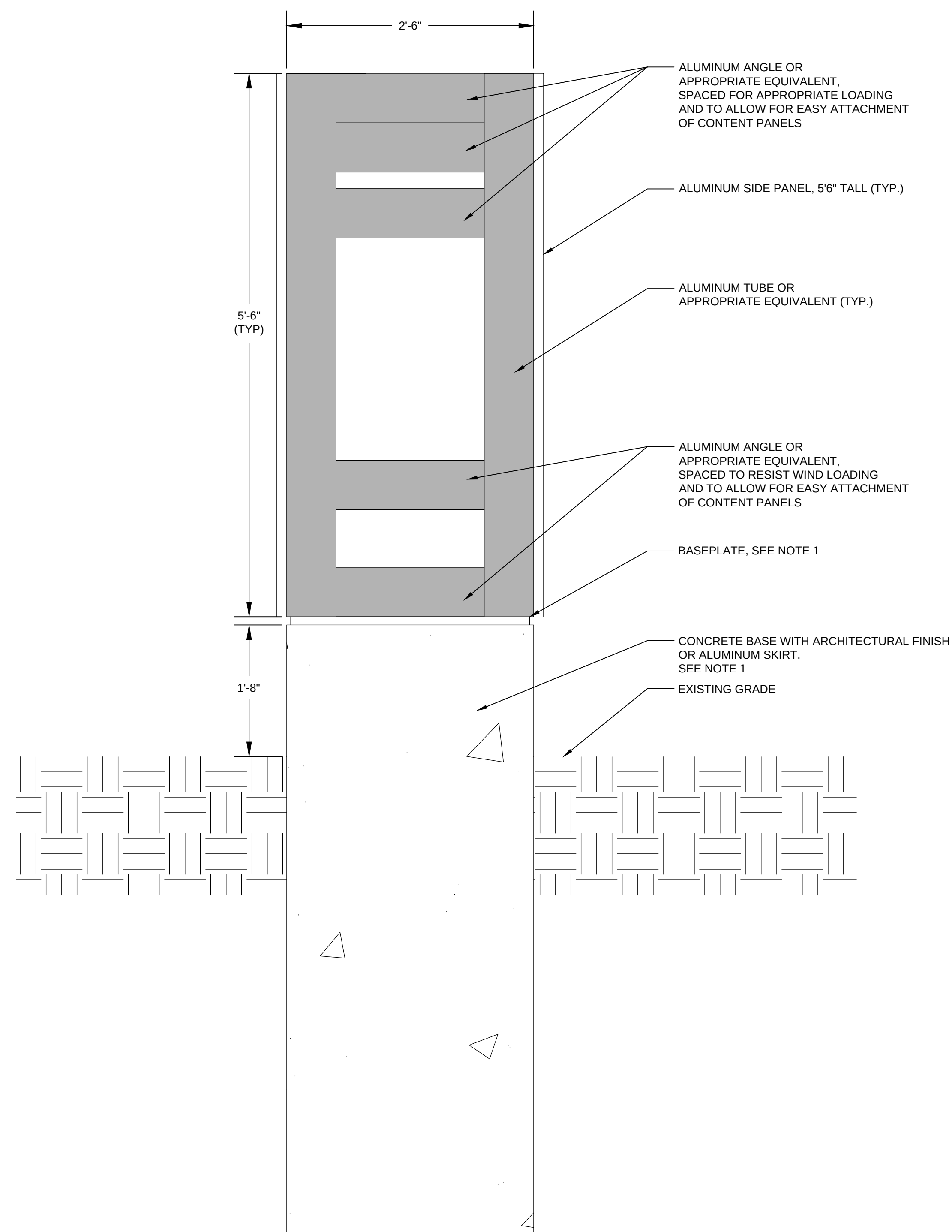
SHEET NAME  
PEDESTRIAN KIOSK  
DETAILS

DRAWING NUMBER

P-2

SHEET NUMBER

10 OF 10



DETAIL 15: PEDESTRIAN KIOSK FRAME AND BASE  
ELEVATION 1

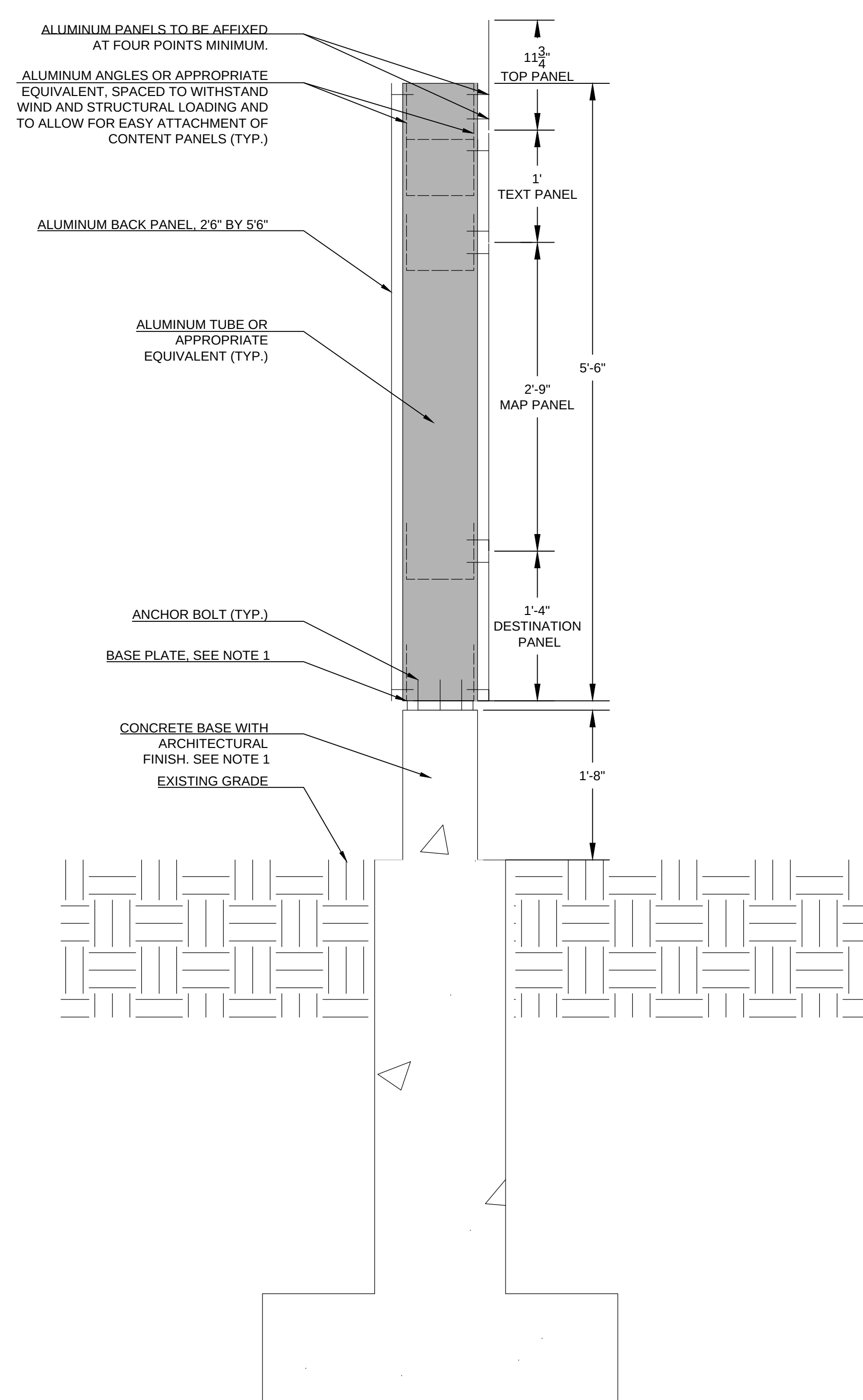
N.T.S.

NOTES:

1. PEDESTRIAN KIOSK TO CONSIST AN ALUMINUM FRAME MOUNTED ON A CONCRETE BASE, WITH EXTERIOR ALUMINUM PANELS. FRAME, BASE, ANCHOR BOLTS, AND PANEL FASTENERS TO BE MANUFACTURED AND ASSEMBLED TO WITHSTAND NORMAL EAST COAST WIND LOADING AND APPROPRIATE STRUCTURAL LOADING. ALUMINUM PANELS TO BE SECURELY FASTENED SO AS TO RESIST MOVEMENT BY WIND. MANUFACTURER TO SUBMIT SHOP DRAWINGS TO CITY OF HYATTSVILLE PRIOR TO FABRICATION, DETAILING FRAME, BASE, AND ATTACHMENT MECHANISMS FOR SECURING THE PANELS TO THE FRAME, AND SECURING THE FRAME TO THE BASE. SHOP DRAWINGS TO BE STAMPED BY STRUCTURAL ENGINEER REGISTERED IN THE STATE OF MARYLAND.

2. ALL PANELS, (TOP PANEL, MAP PANEL, DESTINATION DIRECTORY PANEL, BOTH SIDE PANELS, AND BACK PANEL) TO BE ALUMINUM SHEETS PRINTED WITH A POWDER COAT. DESTINATION DIRECTORY PANEL AND MAP PANEL TO BE EASILY REMOVEABLE AND REPLACEABLE. MANUFACTURER TO SUBMIT SAMPLES OF ALUMINUM PANELS TO THE CITY OF HYATTSVILLE FOR COLOR AND FINISH APPROVAL FOR ALL COLORS.

MANUFACTURER TO SUBMIT SAMPLES OF ALUMINUM PANELS TO THE CITY OF HYATTSVILLE FOR COLOR AND FINISH APPROVAL FOR ALL COLORS.



DETAIL 16: PEDESTRIAN KIOSK FRAME AND BASE  
ELEVATION 2

N.T.S.

NOTES:

1. PEDESTRIAN KIOSK TO CONSIST AN ALUMINUM FRAME MOUNTED ON A CONCRETE BASE, WITH EXTERIOR ALUMINUM PANELS. FRAME, BASE, ANCHOR BOLTS, AND PANEL FASTENERS TO BE MANUFACTURED AND ASSEMBLED TO WITHSTAND NORMAL EAST COAST WIND LOADING AND APPROPRIATE STRUCTURAL LOADING. ALUMINUM PANELS TO BE SECURELY FASTENED SO AS TO RESIST MOVEMENT BY WIND. MANUFACTURER TO SUBMIT SHOP DRAWINGS TO CITY OF HYATTSVILLE PRIOR TO FABRICATION, DETAILING FRAME, BASE, AND ATTACHMENT MECHANISMS FOR SECURING THE PANELS TO THE FRAME, AND SECURING THE FRAME TO THE BASE. SHOP DRAWINGS TO BE STAMPED BY STRUCTURAL ENGINEER REGISTERED IN THE STATE OF MARYLAND.

2. ALL PANELS, (TOP PANEL, MAP PANEL, DESTINATION DIRECTORY PANEL, BOTH SIDE PANELS, AND BACK PANEL) TO BE ALUMINUM SHEETS PRINTED WITH A POWDER COAT. DESTINATION DIRECTORY PANEL AND MAP PANEL TO BE EASILY REMOVEABLE AND REPLACEABLE. MANUFACTURER TO SUBMIT SAMPLES OF ALUMINUM PANELS TO THE CITY OF HYATTSVILLE FOR COLOR AND FINISH APPROVAL FOR ALL COLORS.

MANUFACTURER TO SUBMIT SAMPLES OF ALUMINUM PANELS TO THE CITY OF HYATTSVILLE FOR COLOR AND FINISH APPROVAL FOR ALL COLORS.

| Hyattsville Wayfinding Cost Estimate<br>August 3rd, 2018 |          |      |                       |                         |
|----------------------------------------------------------|----------|------|-----------------------|-------------------------|
| Item                                                     | Quantity | Unit | Unit Cost Range       | Total Cost Range        |
| Bicycle Wayfinding                                       | 88       | EA   | \$ 125                | \$ 11,000               |
| Vehicle Wayfinding                                       | 32       | EA   | \$ 250                | \$ 8,000                |
| 2" Square Metal Post (Furnish and Install)               | 88       | EA   | \$ 100                | \$ 8,800                |
| 5" Square Metal Post (Furnish and Install)               | 64       | EA   | \$ 200                | \$ 12,800               |
| Pedestrian Kiosk                                         | 5        | EA   | \$ 4,500 to \$ 14,500 | \$ 22,500 to \$ 72,500  |
| Kiosk Installation (Per Kiosk)                           | 5        | LS   | \$ 1,800              | \$ 9,000                |
| Total:                                                   |          |      |                       | \$ 72,100 to \$ 122,100 |

Note: Fabrication costs and end product can vary widely based upon materials and production methods chosen. For the pedestrian kiosk, different printing materials for the maps such as a layer of vinyl with a UV clear coat could be more expensive than paint directly on aluminum, but may appear brighter or last longer. Another example of material decisions that could affect costs include whether to leave the kiosk base as concrete with an architectural finish or to complete it with an aluminum skirt. Additionally, different construction methods such as fabricating the kiosk as one "box" piece may be more economical, but may not allow for easy updates of the map panel in the future. Toole Design suggests working more closely with a sign fabricator to find the right final product and associated cost desired by the City of Hyattsville. Costs are an estimate and could vary beyond this range.

## City of Hyattsville Transportation Study

### Project Recommendations - Planning Level Cost Estimate

| Project ID | Project Category   | Project Name                                                                    | Qty/Len(Mi) | Cost Estimate  |
|------------|--------------------|---------------------------------------------------------------------------------|-------------|----------------|
| BB-1       | Bike boulevard     | Jefferson Street or Gallatin Street Bike Blvd (40th Ave to Trolley Trail)       | 0.58        | \$26,225.38    |
| BB-2       | Bike boulevard     | Nicholson Street Bike Blvd from Ager Rd to 40th Ave                             | 1.10        | \$49,940.00    |
| BB-3       | Bike boulevard     | Jamestown Road Bike Blvd from Ager Rd to Oliver Rd                              | 0.80        | \$36,320.00    |
| BB-4       | Bike boulevard     | 40th/41st Avenue Bike Blvd                                                      | 1.10        | \$49,940.00    |
| BB-5       | Bike boulevard     | Oglethorpe Street Bike Blvd                                                     | 0.80        | \$36,466.17    |
| BP-1       | Bike/Ped Crosssing | NW Branch Trail Crossing at 38th Street (MD 208) south of Gaines Alley          | 1           | \$3,100.00     |
| BP-2       | Bike/Ped Crosssing | NW Branch Trail Crossing at Queens Chapel Road (MD 500) south of Jamestown Road | 1           | \$20,900.00    |
| CC-1       | Circulation Change | Gallatin Street two-way conversion                                              | 0.24        | \$57,561.74    |
| CC-2       | Circulation Change | Hamilton Street one-way flip                                                    | 0.30        | \$1,294.89     |
| CC-3       | Circulation Change | Circulation Change Implementation                                               | N/A         | N/A            |
| I-1        | Intersection       | Route 1, Route 1-Alt & Hamilton Street Improvement (major)                      | 1           | \$1,715,000.00 |
| I-2        | Intersection       | 40th Avenue, Gallatin Street, & Hamilton St. Roundabout                         | 1           | \$2,450,000.00 |
| I-3        | Intersection       | East-West Highway & Toledo Terrace Improvement (major)                          | 1           | \$1,715,000.00 |
| I-4        | Intersection       | East-West Highway, Queens Chapel Road, & Adelphi Rd Improvements (major)        | 1           | \$1,715,000.00 |
| I-5        | Intersection       | East-West Highway & Belcrest Road improvement (minor)                           | 1           | \$420,000.00   |
| I-6        | Intersection       | East-West Highway, Queens Chapel Road, & Adelphi Rd Improvements (major)        | 1           | \$1,715,000.00 |
| I-7        | Intersection       | East-West Highway & Route 1 Improvement (minor)                                 | 1           | \$420,000.00   |
| I-8        | Intersection       | Queens Chapel Road & Queensbury Road-Belcrest Road (major)                      | 1           | \$1,715,000.00 |
| I-9        | Intersection       | Route 1 and Farragut Street Reconfiguration (major)                             | 1           | \$1,715,000.00 |
| I-10       | Intersection       | Ager Road & Hamilton Street Reconfiguration (major)                             | 1           | \$1,715,000.00 |
| MU-1       | Multiuse Path      | East-West Highway Multiuse Path (Toledo Terrace to 23rd Avenue)                 | 0.60        | \$115,560.00   |
| MU-2       | Multiuse Path      | East-West Highway Multiuse Path (Toledo Terrace to Adelphi Road)                | 0.70        | \$134,820.00   |
| MU-3       | Multiuse Path      | Northwestern High School Multiuse Trail Connection                              | 0.28        | \$54,715.91    |
| NS-1       | New street         | Toledo Terrace to Heurich Park Road Connection                                  | 0.25        | \$439,585.98   |
| NS-2       | New street         | Editors Park Drive Connection from East-West Highway to Toledo Road             | 0.29        | \$494,698.26   |
| NS-3       | New street         | Freedom Way Connection from Toledo Terrace to Belcrest Road                     | 0.42        | \$735,486.40   |

## City of Hyattsville Transportation Study

### Project Recommendations - Planning Level Cost Estimate

| Project ID | Project Category      | Project Name                                                                       | Qty/Len(Mi) | Cost Estimate  |
|------------|-----------------------|------------------------------------------------------------------------------------|-------------|----------------|
| NS-4       | New street            | 39th Avenue extension from Madison Street to Nicholson Street                      | 0.11        | \$198,141.74   |
| NS-5       | New street            | Calverton Drive extension to Dean Drive                                            | 0.06        | \$118,034.09   |
| NS-6       | New street            | Oliver Street extension from 43rd Avenue to 42nd Place                             | 0.07        | \$114,817.23   |
| NS-7       | New street            | New street network around the West Hyattsville Metro station                       | 0.85        | \$1,472,285.00 |
| NS-8       | New street            | America Boulevard between East-West Highway and Queens Chapel Road                 | 0.19        | \$328,049.24   |
| NS-9       | New street            | America Boulevard extension from Toledo Road to Belcrest Road                      | 0.24        | \$423,183.52   |
| NS-10      | New street            | Toledo Terrace extension between Belcrest Road and Adelphi Road                    | 0.24        | \$421,871.33   |
| NS-11      | New street            | Sentinel Drive between Editors Park Drive and Prince George's Plaza Metro entrance | 0.09        | \$152,542.90   |
| PC-1       | Pedestrian Crossings  | Citywide pedestrian improvements (cost per intersection)                           | 10          | \$401,000.00   |
| PP-1       | Pedestrian Plaza      | 33rd Avenue to Editors Park Drive Plaza                                            | 1.00        | \$6,700.00     |
| PP-2       | Pedestrian Plaza      | Jamestown Road Plaza                                                               | 1.00        | \$6,700.00     |
| R-1        | Reconstruction        | Hamilton Street Complete Street Design and Construction                            | 0.60        | \$766,080.00   |
| R-2        | Reconstruction        | Toledo Road Complete Street Design and Construction                                | 0.80        | \$1,021,440.00 |
| S-1        | Sidewalk installation | East-West Highway to mall at Editors Park Drive                                    | 0.14        | \$27,123.96    |
| S-2        | Sidewalk installation | 34th Avenue to Middle School Ped Connection                                        | 0.04        | \$7,587.12     |
| S-3        | Sidewalk installation | 38th Avenue Sidewalk from Hamilton St to Northwest Branch Trail                    | 0.25        | \$49,809.45    |
| S-4        | Sidewalk installation | Oliver Street Ped connection to NO Middle School                                   | 0.07        | \$13,846.50    |
| S-5        | Sidewalk installation | 41st Avenue Sidewalk from Nicholson Street to Oglethorpe St                        | 0.05        | \$9,977.06     |
| S-6        | Sidewalk installation | 42nd Place to 42nd Ave Ped Connection near Macaroy Street                          | 0.01        | \$2,655.49     |
| S-7        | Sidewalk installation | Nicholson St Sidewalk installation                                                 | 0.08        | \$16,501.99    |
| S-8        | Sidewalk installation | Oliver Street Sidewalk between 42nd Avenue and 43rd Avenue                         | 0.14        | \$28,451.70    |
| SBL-1      | Separated Bike lanes  | Adelphi Road Protected Bike Lanes                                                  | 1.40        | \$261,380.00   |
| SBL-2      | Separated Bike lanes  | Belcrest Road Protected Bike Lanes                                                 | 0.83        | \$155,052.94   |
| SBL-3      | Separated Bike lanes  | Toledo Terrace Protected Bike Lanes                                                | 0.60        | \$112,408.96   |
| SS-1       | Streetscape           | Various streets (City Wide)                                                        | N/A         | N/A            |
| TC-1       | Traffic Calming       | Revamp the traffic calming program                                                 | N/A         | N/A            |

## City of Hyattsville Transportation Study

### Project Recommendations - Planning Level Cost Estimate

| Project ID | Project Category | Project Name                                           | Qty/Len(Mi) | Cost Estimate |
|------------|------------------|--------------------------------------------------------|-------------|---------------|
| TC-2       | Traffic Calming  | 3900 Block of Jefferson Street Traffic Calming         | 1.00        | \$27,800.00   |
| TC-3       | Traffic Calming  | Queensbury Road Traffic Calming                        | 1.00        | \$140,800.00  |
| TS-1       | Traffic signal   | Ager Road and Lancer Drive Traffic signal              | 1           | \$ 367,500.00 |
| TS-2       | Traffic signal   | Queens Chapel Road and Nicholson Street Traffic Signal | 1           | \$ 367,500.00 |
| TS-3       | Traffic signal   | Ager Road and Nicholson Street Traffic Signal          | 1           | \$ 367,500.00 |
| TS-4       | Traffic signal   | Queens Chapel Road and Lancer Drive Traffic Signal     | 1           | \$ 367,500.00 |
| TS-5       | Traffic signal   | East-West Highway and America Boulevard Traffic Signal | 1           | \$ 367,500.00 |
| TS-6       | Traffic signal   | Route 1 Alternate and Armentrout Drive Traffic Signal  | 1           | \$ 367,500.00 |
| WF-1       | Wayfinding       | Wayfinding Overhaul                                    | LS          | 117342.75     |

Cost estimates were developed by identifying pay items and establishing rough quantities, including a 35% contingency. Please note that the estimates include approximate costs for asphalt, concrete, drainage improvements, limited utility relocation, pavement markings, signs and traffic signal adjustments. The estimate does not include easement, right-of-way acquisition, environmental permitting or the cost for ongoing maintenance. A 40% contingency has been added for soft costs (engineering, survey, permitting, inspection, etc). A cost has been assigned to some general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall estimates are intended to be general and used for planning purposes. Construction costs will vary based on the ultimate project scope (i.e. potential combination of projects), schedule, and economic conditions at the time of construction.



## Bike Boulevard (per mile)

Assumes a shared lane marking symbol pair every 200 feet, along with regulatory signs with posts every 1000 feet.

Assumes shared lane marking symbols can be added without the need for modifications to existing roadway pavement markings.

Assumes additional traffic calming project types can be implemented in conjunction with Neighborhood Bikeway.

Unit prices are based on Prince George's County DPWT or MSHA

| Item                       | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|----------------------------|------|----------|-----------|----------------------------------------|
| Regulatory Signs/Posts     | EA   | 5        | \$330.00  | \$1,742                                |
| Bikeway Sign               | EA   | 8        | \$420.00  | \$3,360                                |
| Shared Lane Marking Symbol | EA   | 53       | \$350.00  | \$18,480                               |
|                            |      |          |           |                                        |
| <b>Subtotal</b>            |      |          |           | <b>\$23,582</b>                        |

|                |            |
|----------------|------------|
| Lump Sum Items | \$2,358.24 |
|----------------|------------|

Maintenance of Traffic (5%)

Mobilization (5%)

|                 |                    |
|-----------------|--------------------|
| <b>Subtotal</b> | <b>\$25,940.64</b> |
|-----------------|--------------------|

35% Contingency \$9,079.22

40% Project Soft Costs \$10,376.26

|                             |                    |
|-----------------------------|--------------------|
| <b>Estimated Total Cost</b> | <b>\$45,400.00</b> |
|-----------------------------|--------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.



## Bike / Pedestrian Crossing (BP-1)

Assumes installation of standard raised crosswalk DPWT Standard 700.02

Assumes 26' wide, two-lane roadway.

Assume 4 signs per raised crosswalk.

Unit prices are based on Prince George's County DPWT or MSHA

| Item                               | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|------------------------------------|------|----------|-----------|----------------------------------------|
| 2" Mill Notch in Existing Pavement | SY   | 9        | 5         | \$43                                   |
| 2" Hot Mix Asphalt, 9.5mm PG 64-22 | SY   | 35       | 8         | \$277                                  |
| 3" Hot Mix Asphalt, 9.5mm PG 64-23 | SY   | 29       | 11        | \$318                                  |
| High Visibility Crosswalk          | EA   | 1        | 2,500     | \$2,500                                |
| Regulatory Signs/Posts             | EA   | 4        | \$330     | \$1,320                                |
|                                    |      |          |           |                                        |
| <b>Subtotal</b>                    |      |          |           | <b>\$1,320</b>                         |

|                |          |
|----------------|----------|
| Lump Sum Items | \$462.00 |
|----------------|----------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                        |                   |
|------------------------|-------------------|
| <b>Subtotal</b>        | <b>\$1,782.00</b> |
| 35% Contingency        | \$623.70          |
| 40% Project Soft Costs | \$712.80          |

|                             |                   |
|-----------------------------|-------------------|
| <b>Estimated Total Cost</b> | <b>\$3,100.00</b> |
|-----------------------------|-------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Bike / Pedestrian Crossing (BP-2)

Assumes installation of standard raised crosswalk DPWT Standard 700.02

Assumes 100' wide crossing with 6 lanes and median refuge.

Assume 4 signs per raised crosswalk.

Unit prices are based on Prince George's County DPWT or MSHA

| Item                               | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|------------------------------------|------|----------|-----------|----------------------------------------|
| 2" Mill Notch in Existing Pavement | SY   | 26       | 5         | \$130                                  |
| 2" Hot Mix Asphalt, 9.5mm PG 64-22 | SY   | 140      | 8         | \$1,120                                |
| 3" Hot Mix Asphalt, 9.5mm PG 64-23 | SY   | 116      | 11        | \$1,276                                |
| High Visibility Crosswalk          | EA   | 2        | 2,500     | \$5,000                                |
| Regulatory Signs/Posts             | EA   | 4        | \$330     | \$1,320                                |
|                                    |      |          |           |                                        |
| <b>Subtotal</b>                    |      |          |           | <b>\$8,846</b>                         |

|                |            |
|----------------|------------|
| Lump Sum Items | \$3,096.10 |
|----------------|------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                 |                    |
|-----------------|--------------------|
| <b>Subtotal</b> | <b>\$11,942.10</b> |
|-----------------|--------------------|

35% Contingency \$4,179.74

40% Project Soft Costs \$4,776.84

|                             |                    |
|-----------------------------|--------------------|
| <b>Estimated Total Cost</b> | <b>\$20,900.00</b> |
|-----------------------------|--------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Circulaton Change (CC-1 per mile)

Assume eradication of existing markings only; repaving not included.

Unit prices are based on Prince George's County DPWT or MSHA

| Item                                | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|-------------------------------------|------|----------|-----------|----------------------------------------|
| Regulatory Signs/Posts              | EA   | 5        | \$330.00  | \$1,742                                |
| Thermoplastic Yellow Lane Line (4") | LF   | 5280     | \$3.00    | \$15,840                               |
| Erradicate Ex Pave Mark Symbols     | EA   | 6        | \$75.00   | \$450                                  |
| Erradicate Ex linear Pave Markings  | LF   | 5280     | \$20.00   | \$105,600                              |
|                                     |      |          |           |                                        |
| <b>Subtotal</b>                     |      |          |           | <b>\$123,632</b>                       |

|                |             |
|----------------|-------------|
| Lump Sum Items | \$12,363.24 |
|----------------|-------------|

Maintenance of Traffic (5%)

Mobilization (5%)

|                        |                     |
|------------------------|---------------------|
| <b>Subtotal</b>        | <b>\$135,995.64</b> |
| 35% Contingency        | \$47,598.47         |
| 40% Project Soft Costs | \$54,398.26         |

|                             |                     |
|-----------------------------|---------------------|
| <b>Estimated Total Cost</b> | <b>\$238,000.00</b> |
|-----------------------------|---------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Circulation Change (CC-2 per mile)

Assume 5 intersections per mile.

Unit prices are based on Prince George's County DPWT or MSHA

| Item                            | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|---------------------------------|------|----------|-----------|----------------------------------------|
| Regulatory Signs/Posts          | EA   | 5        | \$330.00  | \$1,742                                |
| Thermoplastic Stop Bar, 24 inch | LF   | 80       | \$6.00    | \$480                                  |
| <b>Subtotal</b>                 |      |          |           | <b>\$2,222</b>                         |

|                |          |
|----------------|----------|
| Lump Sum Items | \$222.24 |
|----------------|----------|

Maintenance of Traffic (5%)

Mobilization (5%)

|                 |                   |
|-----------------|-------------------|
| <b>Subtotal</b> | <b>\$2,444.64</b> |
|-----------------|-------------------|

35% Contingency \$855.62

40% Project Soft Costs \$977.86

|                             |                   |
|-----------------------------|-------------------|
| <b>Estimated Total Cost</b> | <b>\$4,300.00</b> |
|-----------------------------|-------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Intersection Reconfiguration (Major)

Assumes major construction to intersection (re-aligning legs, removal of slip lanes, changes in curb and radi, medians, etc)

Assumes reconstruction of sidewalks and handicap ramps

Assume lump sum for lighting and traffic signal modifications per intersections.

Unit prices are based on similar project recommendations

| Item                              | Unit | Quantity | Unit Cost    | Opinion of Probable Construction Costs |
|-----------------------------------|------|----------|--------------|----------------------------------------|
| Major Intersection Reconstruction | EA   | 1        | \$700,000.00 | \$700,000                              |
| <b>Subtotal</b>                   |      |          |              | <b>\$700,000</b>                       |

|                |              |
|----------------|--------------|
| Lump Sum Items | \$280,000.00 |
|----------------|--------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (10%)

Utility Adjustments (10%)

|                             |                       |
|-----------------------------|-----------------------|
| <b>Subtotal</b>             | <b>\$980,000.00</b>   |
| 35% Contingency             | \$343,000.00          |
| 40% Project Soft Costs      | \$392,000.00          |
| <b>Estimated Total Cost</b> | <b>\$1,715,000.00</b> |

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Intersection Reconfiguration (Minor)

Assumes only minor construction to curb ramps

Assumes realignment and space allocation of travel lanes (Pavement Marking)

Assumes no changes to traffic signals (if applicable) and minimal utility work

Assume minimal lighting modifications

Unit prices are based on similar project recommendations

| Item                               | Unit | Quantity | Unit Cost    | Opinion of Probable Construction Costs |
|------------------------------------|------|----------|--------------|----------------------------------------|
| Minor Intersection Reconfiguration | EA   | 1        | \$200,000.00 | \$200,000                              |
| <b>Subtotal</b>                    |      |          |              | <b>\$200,000</b>                       |

|                |             |
|----------------|-------------|
| Lump Sum Items | \$40,000.00 |
|----------------|-------------|

Maintenance of Traffic (5%)

Mobilization (10%)

Utility Adjustments (5%)

|                        |                     |
|------------------------|---------------------|
| <b>Subtotal</b>        | <b>\$240,000.00</b> |
| 35% Contingency        | \$84,000.00         |
| 40% Project Soft Costs | \$96,000.00         |

|                             |                     |
|-----------------------------|---------------------|
| <b>Estimated Total Cost</b> | <b>\$420,000.00</b> |
|-----------------------------|---------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Intersection Reconfiguration (Roundabout)

Assume 100' diameter single lane roundabout

Assume 5 leg intersection

Assumes sidewalk is 5 feet wide

Assume lump sum for lighting and traffic signal modifications per intersections.

Unit prices are based on similar project recommendations

| Item                             | Unit | Quantity | Unit Cost      | Opinion of Probable Construction Costs |
|----------------------------------|------|----------|----------------|----------------------------------------|
| 100' dia. Single Lane Roundabout | EA   | 1        | \$1,000,000.00 | \$1,000,000                            |
| Subtotal                         |      |          |                | \$1,000,000                            |

|                |              |
|----------------|--------------|
| Lump Sum Items | \$400,000.00 |
|----------------|--------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (10%)

Utility Adjustments (10%)

|                        |                |
|------------------------|----------------|
| Subtotal               | \$1,400,000.00 |
| 35% Contingency        | \$490,000.00   |
| 40% Project Soft Costs | \$560,000.00   |

|                      |                |
|----------------------|----------------|
| Estimated Total Cost | \$2,450,000.00 |
|----------------------|----------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Multituse Path (per mile)

Assumes a 12' wide multituse path.

Assumes 16' of grading, 1' down.

Assumes standard pavement from Prince George's County Standard DPWT 100.17

Unit prices are based on Prince George's County DPWT or MSHA

| Item                             | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|----------------------------------|------|----------|-----------|----------------------------------------|
| Earthwork/Excavation/Grading     | CY   | 3129     | \$10.00   | \$31,289                               |
| 3" Hot Mix Asphalt (12.5mm)      | SY   | 1760     | \$11.00   | \$19,360                               |
| 4" Graded Aggregate Subbase      | SY   | 2323     | \$5.00    | \$11,616                               |
| Regulatory Signs/Posts           | EA   | 5        | \$330.00  | \$1,742                                |
| Bike Signs                       | EA   | 4        | \$420.00  | \$1,680                                |
| Thermoplastic Yellow 4" (Dashed) | LF   | 5280     | \$3.00    | \$15,840                               |
| <b>Subtotal</b>                  |      |          |           | <b>\$81,527</b>                        |

|                |             |
|----------------|-------------|
| Lump Sum Items | \$28,534.55 |
|----------------|-------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                        |                     |
|------------------------|---------------------|
| <b>Subtotal</b>        | <b>\$110,061.84</b> |
| 35% Contingency        | \$38,521.64         |
| 40% Project Soft Costs | \$44,024.74         |

|                             |                     |
|-----------------------------|---------------------|
| <b>Estimated Total Cost</b> | <b>\$192,600.00</b> |
|-----------------------------|---------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.



## New Street (per mile)

Assume 36' wide standard Prince George's County Urban Primary Residential Road.

Assumes one streetlight every 150' per DPW&T Standards

Assumes street trees are included in landscaping contingency.

Unit prices are based on Prince George's County DPWT of MSHA

| Item                                          | Unit | Quantity | Unit Cost   | Opinion of Probable Construction Costs |
|-----------------------------------------------|------|----------|-------------|----------------------------------------|
| Subgrade; CBR>7 (12" gravel)                  | CY   | 7040     | \$ 40.00    | \$281,600                              |
| 6" Graded Aggregate Subbase Course            | SY   | 10560    | \$ 7.00     | \$73,920                               |
| 3" Hot Mix Asphalt Base Course; 19mm          | SY   | 5280     | \$ 11.00    | \$58,080                               |
| 1-1/2" Intermediate Surface Course; 9.5mm     | SY   | 2640     | \$ 6.00     | \$15,840                               |
| 1-1/2" Final Surface Course; 9.5mm            | SY   | 2640     | \$ 6.00     | \$15,840                               |
| Street Lighting: Pendant or Colonial          | EA   | 36       | \$ 1,450.00 | \$52,200                               |
| Thermoplastic White Pavement Marking, 4 inch  | LF   | 10560    | \$ 2.00     | \$21,120                               |
| Thermoplastic Yellow Pavement Marking, 4 inch | LF   | 10560    | \$ 2.00     | \$21,120                               |
| 5" Sidewalk                                   | SF   | 31680    | \$6.00      | \$190,080                              |
| <b>Subtotal</b>                               |      |          |             | <b>\$729,800</b>                       |

|                |              |
|----------------|--------------|
| Lump Sum Items | \$255,430.00 |
|----------------|--------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                        |                     |
|------------------------|---------------------|
| <b>Subtotal</b>        | <b>\$989,800.00</b> |
| 35% Contingency        | \$346,430.00        |
| 40% Project Soft Costs | \$395,920.00        |

|                             |                       |
|-----------------------------|-----------------------|
| <b>Estimated Total Cost</b> | <b>\$1,732,100.00</b> |
|-----------------------------|-----------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## New Street with Bike Lanes (per mile)

Assume 46' wide standard Prince George's County Urban Primary Residential Road.

Assumes one-way, 5' wide bike lanes on either side.

Assumes one streetlight every 150' per DPW&T Standards

Unit prices are based on Prince George's County DPWT or MSHA

| Item                                          | Unit | Quantity | Unit Cost   | Opinion of Probable Construction Costs |
|-----------------------------------------------|------|----------|-------------|----------------------------------------|
| Subgrade; CBR>7 (12" of gravel)               | CY   | 8,996    | \$ 40.00    | \$359,822                              |
| 6" Graded Aggregate Subbase Course            | SY   | 13,493   | \$ 7.00     | \$94,453                               |
| 3" Hot Mix Asphalt Base Course; 19mm          | SY   | 6,747    | \$ 11.00    | \$74,213                               |
| 1-1/2" Intermediate Surface Course; 9.5mm     | SY   | 3,373    | \$ 6.00     | \$20,240                               |
| 1-1/2" Final Surface Course; 9.5mm            | SY   | 3,373    | \$ 6.00     | \$20,240                               |
| Street Lighting: Pendant or Colonial          | EA   | 36       | \$ 1,450.00 | \$52,200                               |
| Thermoplastic White Pavement Marking, 4 inch  | LF   | 21,120   | \$ 2.00     | \$42,240                               |
| Thermoplastic Yellow Pavement Marking, 4 inch | LF   | 10,560   | \$ 2.00     | \$21,120                               |
| Bicycle Lane Symbol                           | EA   | 10       | \$ 250.00   | \$2,500                                |
| 5" Sidewalk                                   | SF   | 31,680   | \$6.00      | \$190,080                              |
| <b>Subtotal</b>                               |      |          |             | <b>\$877,109</b>                       |

|                |              |
|----------------|--------------|
| Lump Sum Items | \$306,988.11 |
|----------------|--------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                        |                       |
|------------------------|-----------------------|
| <b>Subtotal</b>        | <b>\$1,187,108.89</b> |
| 35% Contingency        | \$415,488.11          |
| 40% Project Soft Costs | \$474,843.55          |

|                             |                       |
|-----------------------------|-----------------------|
| <b>Estimated Total Cost</b> | <b>\$2,077,400.00</b> |
|-----------------------------|-----------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Pedestrian Crossings (per intersection)

Assume 6 foot wide by 20 feet long by 6 inch depth per curb extension.

Assume 35 feet of 24" curb and gutter on each curb extension

Assumes sidewalk is 5 feet wide by 20 feet long and 4 inches deep.

Assume one ADA-compliant curb ramp (Type A) per curb extension.

Assumes standard pedestrian crosswalk at all legs of 4-leg intersection.

Unit prices are based on Prince George's County DPWT or MSHA

| Item                                          | Unit | Quantity | Unit Cost   | Opinion of Probable Construction Costs |
|-----------------------------------------------|------|----------|-------------|----------------------------------------|
| Earthwork/Excavation/Grading                  | CY   | 9        | \$10.00     | \$90                                   |
| Remove Pavement                               | SY   | 60       | \$4.00      | \$240                                  |
| Remove curb and gutter                        | LF   | 100      | \$4.00      | \$400                                  |
| Remove sidewalk                               | LF   | 80       | \$2.00      | \$160                                  |
| Concrete sidewalk 4"                          | LF   | 80       | \$20.00     | \$1,600                                |
| Concrete Curb & Gutter                        | LF   | 140      | \$15.00     | \$2,100                                |
| ADA-compliant ramp (type Ramp A)              | EA   | 4        | \$600.00    | \$2,400                                |
| Standard high-visibility Pedestrian Crosswalk | EA   | 4        | \$ 2,500.00 | \$10,000                               |
| <b>Subtotal</b>                               |      |          |             | <b>\$16,990</b>                        |

|                |            |
|----------------|------------|
| Lump Sum Items | \$5,946.50 |
|----------------|------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                        |                    |
|------------------------|--------------------|
| <b>Subtotal</b>        | <b>\$22,936.50</b> |
| 35% Contingency        | \$8,027.78         |
| 40% Project Soft Costs | \$9,174.60         |

|                             |                    |
|-----------------------------|--------------------|
| <b>Estimated Total Cost</b> | <b>\$40,100.00</b> |
|-----------------------------|--------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Pedestrian Plaza

Assumes decorative pavers, grading and signs

Unit prices are based on Prince George's County DPWT or MSHA

| Item             | Unit | Quantity | Unit Cost  | Opinion of Probable Construction Costs |
|------------------|------|----------|------------|----------------------------------------|
| Signs/Posts      | EA   | 2        | \$330.00   | \$660                                  |
| Concrete removal | SF   | 100      | \$2.00     | \$200                                  |
| Mild Grading     | EA   | 1        | \$1,000.00 | \$1,000                                |
| Concrete Pavers  | SF   | 100      | \$18.00    | \$1,800                                |
|                  |      |          |            |                                        |
| <b>Subtotal</b>  |      |          |            | <b>\$3,660</b>                         |

|                |          |
|----------------|----------|
| Lump Sum Items | \$183.00 |
|----------------|----------|

Mobilization (5%)

|                 |                   |
|-----------------|-------------------|
| <b>Subtotal</b> | <b>\$3,843.00</b> |
|-----------------|-------------------|

35% Contingency \$1,345.05

40% Project Soft Costs \$1,537.20

|                             |                   |
|-----------------------------|-------------------|
| <b>Estimated Total Cost</b> | <b>\$6,700.00</b> |
|-----------------------------|-------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Reconstruction- Complete Street (per mile)

Assume road diet and bike lanes

Assumes one-way, 5' wide bike lanes on either side.

Assumes one streetlight every 150' per DPW&T Standards

Unit prices are based on Prince George's County DPWT or MSHA

| Item                                          | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|-----------------------------------------------|------|----------|-----------|----------------------------------------|
| Street Lighting: Pendant or Colonial          | EA   | 36       | \$1,450   | \$52,200                               |
| Thermoplastic White Pavement Marking, 4 inch  | LF   | 21120    | \$2       | \$42,240                               |
| Thermoplastic Yellow Pavement Marking, 4 inch | LF   | 10560    | \$2       | \$21,120                               |
| Bicycle Lane Symbol                           | EA   | 10       | \$250     | \$2,500                                |
| 8' Sidewalk with concrete pavers              | LF   | 10560    | \$40      | \$422,400                              |
| <b>Subtotal</b>                               |      |          |           | <b>\$540,460</b>                       |

|                |           |
|----------------|-----------|
| Lump Sum Items | \$189,161 |
|----------------|-----------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                 |                  |
|-----------------|------------------|
| <b>Subtotal</b> | <b>\$729,621</b> |
|-----------------|------------------|

35% Contingency \$255,367

40% Project Soft Costs \$291,848

|                             |                    |
|-----------------------------|--------------------|
| <b>Estimated Total Cost</b> | <b>\$1,276,800</b> |
|-----------------------------|--------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Sidewalk Installation (per mile)

Assume concrete sidewalk is a minimum 5 feet wide and 4 inches in depth.

Assumes no right of way acquisition.

Unit prices are based on Prince George's County DPWT or MSHA

| Item              | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|-------------------|------|----------|-----------|----------------------------------------|
| Concrete Sidewalk | LF   | 5280     | \$16.00   | \$84,480                               |
| <b>Subtotal</b>   |      |          |           | <b>\$84,480</b>                        |

|                |             |
|----------------|-------------|
| Lump Sum Items | \$29,568.00 |
|----------------|-------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                 |                     |
|-----------------|---------------------|
| <b>Subtotal</b> | <b>\$114,480.00</b> |
|-----------------|---------------------|

35% Contingency \$40,068.00

40% Project Soft Costs \$45,792.00

|                             |                     |
|-----------------------------|---------------------|
| <b>Estimated Total Cost</b> | <b>\$200,300.00</b> |
|-----------------------------|---------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Separated Bike Lanes (per mile)

Assume flexposts and pavement markings to create bike lane protection.

Assumes diagonal pavement marking buffer with flex posts; 20' o.c.

Assumes one-way, 5' wide bike lanes on either side with 2' painted buffer.

Unit prices are based on Prince George's County DPWT or MSHA

| Item                                         | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|----------------------------------------------|------|----------|-----------|----------------------------------------|
| Thermoplastic White Pavement Marking, 4 inch | LF   | 14784    | \$ 2.00   | \$29,568                               |
| Thermoplastic White Pavement Marking, 5 inch | LF   | 10560    | \$ 3.00   | \$31,680                               |
| Regulatory Signs                             | EA   | 5        | \$ 330.00 | \$1,650                                |
| Bikeway Signs                                | EA   | 8        | \$ 420.00 | \$3,360                                |
| Flexible Delineators                         | EA   | 264      | \$ 30.00  | \$7,920                                |
| Bicycle Lane Symbol                          | EA   | 10       | \$ 250.00 | \$2,500                                |
| <b>Subtotal</b>                              |      |          |           | <b>\$76,678</b>                        |

|                |             |
|----------------|-------------|
| Lump Sum Items | \$26,837.30 |
|----------------|-------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                        |                     |
|------------------------|---------------------|
| <b>Subtotal</b>        | <b>\$106,678.00</b> |
| 35% Contingency        | \$37,337.30         |
| 40% Project Soft Costs | \$42,671.20         |

|                             |                     |
|-----------------------------|---------------------|
| <b>Estimated Total Cost</b> | <b>\$186,700.00</b> |
|-----------------------------|---------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Traffic Calming (TC-1)

Assume 4 legged intersections.

Unit prices are based on Prince George's County DPWT or MSHA

| Item                                   | Unit | Quantity | Unit Cost    | Opinion of Probable Construction Costs |
|----------------------------------------|------|----------|--------------|----------------------------------------|
| Traffic Signal - 4 Legged Intersection | EA   | 1        | \$150,000.00 | \$150,000                              |
| <b>Subtotal</b>                        |      |          |              | <b>\$150,000</b>                       |

|                |             |
|----------------|-------------|
| Lump Sum Items | \$52,500.00 |
|----------------|-------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                 |                     |
|-----------------|---------------------|
| <b>Subtotal</b> | <b>\$210,000.00</b> |
|-----------------|---------------------|

|                 |             |
|-----------------|-------------|
| 35% Contingency | \$73,500.00 |
|-----------------|-------------|

|                        |             |
|------------------------|-------------|
| 40% Project Soft Costs | \$84,000.00 |
|------------------------|-------------|

|                             |                     |
|-----------------------------|---------------------|
| <b>Estimated Total Cost</b> | <b>\$367,500.00</b> |
|-----------------------------|---------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.



## Traffic Calming (TC-2)

Assume 3-legged intersection and two curb extensions  
 Curb Extensions at the intersection of 38th Street and Jefferson Street.  
 Assume 6 foot wide by 20 feet long by 6 inch depth per curb extension.  
 Assume 35 feet of curb and gutter.  
 Assumes sidewalk is 5 feet wide by 20 feet long and 4 inches deep.  
 Assume one ADA-compliant curb ramp per curb extension.  
 Unit prices are based on Prince George's County DPWT or MSHA

| Item                         | Unit | Quantity | Unit Cost  | Opinion of Probable Construction Costs |
|------------------------------|------|----------|------------|----------------------------------------|
| Pavement Removal             | SY   | 27       | 4          | \$108                                  |
| Earthwork/Excavation/Grading | EA   | 1        | \$3,000.00 | \$3,000                                |
| Subbase                      | SY   | 27       | \$7.00     | \$189                                  |
| Concrete sidewalk 4"         | LF   | 40       | \$20.00    | \$800                                  |
| Concrete Curb & Gutter       | LF   | 70       | \$15.00    | \$1,050                                |
| ADA-compliant ramp           | EA   | 2        | \$600.00   | \$1,200                                |
| Landscape modifications      | LS   | 1        | \$5,000.00 | \$5,000                                |
|                              |      |          |            |                                        |
| <b>Subtotal</b>              |      |          |            | <b>\$11,347</b>                        |

|                       |                   |
|-----------------------|-------------------|
| <b>Lump Sum Items</b> | <b>\$4,538.80</b> |
|-----------------------|-------------------|

Drainage/Erosion & Sediment Control (10%)  
 Landscaping (5%)  
 Maintenance of Traffic (5%)  
 Mobilization (10%)  
 Utility Adjustments (10%)

|                        |                    |
|------------------------|--------------------|
| <b>Subtotal</b>        | <b>\$15,885.80</b> |
| 35% Contingency        | \$5,560.03         |
| 40% Project Soft Costs | \$6,354.32         |

|                             |                    |
|-----------------------------|--------------------|
| <b>Estimated Total Cost</b> | <b>\$27,800.00</b> |
|-----------------------------|--------------------|

Actual costs may vary based on project scope and current market conditions.  
 Costs do not include environmental permitting, easement or property acquisition.  
 Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.  
 Lump sum items includes anticipated work associated with implementation of project type.

### Traffic Calming (TC-3)

Assumes 4 curb extensions, two concrete islands and two neighborhood mini circles

Assume 6 foot wide by 20 feet long by 6 inch depth per curb extension.

Assume 35 feet of curb and gutter.

Assumes sidewalk is 5 feet wide by 20 feet long and 4 inches deep.

Assume one ADA-compliant curb ramp per curb extension.

Assume concrete islands are 120 SF or smaller

Neighborhood mini circle assumes 4 way intersection, a concrete circle 16' diameter and all associated pavement markings and signage

Unit prices are based on Prince George's County DPWT, MSHA or similar project information

| Item                         | Unit | Quantity | Unit Cost   | Opinion of Probable Construction Costs |
|------------------------------|------|----------|-------------|----------------------------------------|
| Pavement Removal             | SY   | 54       | \$4.00      | \$216                                  |
| Earthwork/Excavation/Grading | EA   | 1        | \$5,000.00  | \$5,000                                |
| Subbase                      | SY   | 54       | \$7.00      | \$378                                  |
| Concrete sidewalk 4"         | LF   | 80       | \$20.00     | \$1,600                                |
| Concrete Curb & Gutter       | LF   | 140      | \$15.00     | \$2,100                                |
| ADA-compliant ramp           | EA   | 4        | \$600.00    | \$2,400                                |
| Concrete Islands (2)         | SY   | 13       | \$60.00     | \$780                                  |
| Neighborhood Mini Circle     | EA   | 2        | \$20,000.00 | \$40,000                               |
| Landscape modifications      | LS   | 1        | \$5,000.00  | \$5,000                                |
|                              |      |          |             |                                        |
| <b>Subtotal</b>              |      |          |             | <b>\$57,474</b>                        |

|                |             |
|----------------|-------------|
| Lump Sum Items | \$22,989.60 |
|----------------|-------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (10%)

Utility Adjustments (10%)

|                 |                    |
|-----------------|--------------------|
| <b>Subtotal</b> | <b>\$80,463.60</b> |
|-----------------|--------------------|

35% Contingency \$28,162.26

40% Project Soft Costs \$32,185.44

|                             |                     |
|-----------------------------|---------------------|
| <b>Estimated Total Cost</b> | <b>\$140,800.00</b> |
|-----------------------------|---------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Traffic Signal

Assume 4 legged intersections.

Unit prices are based on similar projects

| Item                                   | Unit | Quantity | Unit Cost    | Opinion of Probable Construction Costs |
|----------------------------------------|------|----------|--------------|----------------------------------------|
| Traffic Signal - 4 Legged Intersection | EA   | 1        | \$150,000.00 | \$150,000                              |
| <b>Subtotal</b>                        |      |          |              | <b>\$150,000</b>                       |

|                |             |
|----------------|-------------|
| Lump Sum Items | \$52,500.00 |
|----------------|-------------|

Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

|                 |                     |
|-----------------|---------------------|
| <b>Subtotal</b> | <b>\$210,000.00</b> |
|-----------------|---------------------|

|                 |             |
|-----------------|-------------|
| 35% Contingency | \$73,500.00 |
|-----------------|-------------|

|                        |             |
|------------------------|-------------|
| 40% Project Soft Costs | \$84,000.00 |
|------------------------|-------------|

|                             |                     |
|-----------------------------|---------------------|
| <b>Estimated Total Cost</b> | <b>\$367,500.00</b> |
|-----------------------------|---------------------|

Actual costs may vary based on project scope and current market conditions.

Costs do not include environmental permitting, easement or property acquisition.

Project Soft Costs assume engineering, surveying, permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

## Wayfinding

Unit prices are based on MDSHA Historic Pricing Data and fabricator estimates.

| Item                                       | Unit | Quantity | Unit Cost | Opinion of Probable Construction Costs |
|--------------------------------------------|------|----------|-----------|----------------------------------------|
| Bicycle Wayfinding                         | EA   | 88       | \$ 125    | \$11,000                               |
| Vehicle Wayfinding                         | EA   | 32       | \$ 250    | \$8,000                                |
| 2" Square Metal Post (Furnish and Install) | EA   | 88       | \$ 100    | \$8,800                                |
| 5" Square Metal Post (Furnish and Install) | EA   | 64       | \$ 200    | \$12,800                               |
| Pedestrian Kiosk                           | EA   | 5        | \$ 4,500  | \$22,500                               |
| Kiosk Installation (Per Kiosk)             | EA   | 5        | \$ 1,800  | \$9,000                                |
| <b>Subtotal</b>                            |      |          |           | <b>\$72,100</b>                        |

|                   |            |
|-------------------|------------|
| Lump Sum Items    | \$3,605.00 |
| Mobilization (5%) |            |

|                        |                    |
|------------------------|--------------------|
| <b>Subtotal</b>        | <b>\$75,705.00</b> |
| 35% Contingency        | \$26,496.75        |
| 20% Project Soft Costs | \$15,141.00        |

|                             |                     |
|-----------------------------|---------------------|
| <b>Estimated Total Cost</b> | <b>\$117,342.75</b> |
|-----------------------------|---------------------|

Actual costs may vary based on project scope and current market conditions.

Project Soft Costs include permitting, project management, and inspection services.

Lump sum items includes anticipated work associated with implementation of project type.

Note: Fabrication costs and end product can vary widely based upon materials and production methods chosen. For the pedestrian kiosk, different printing materials for the maps such as a layer of vinyl with a UV clear coat could be more expensive than paint directly on aluminum, but may appear brighter or last longer. Another example of material decisions that could affect costs include whether to leave the kiosk base as concrete with an architectural finish or to complete it with an aluminum skirt. Additionally, different construction methods such as fabricating the kiosk as one "box" piece may be more economical, but may not allow for easy updates of the map panel in the future. Toole Design suggests working more closely with a sign fabricator to find the right final product and associated cost desired by the City of Hyattsville. Costs are an estimate and could vary beyond this range.



# HYATTSVILLE

## TRANSPORTATION STUDY

City Council Update – October 1, 2018



**TOOLE**  
DESIGN

# Agenda

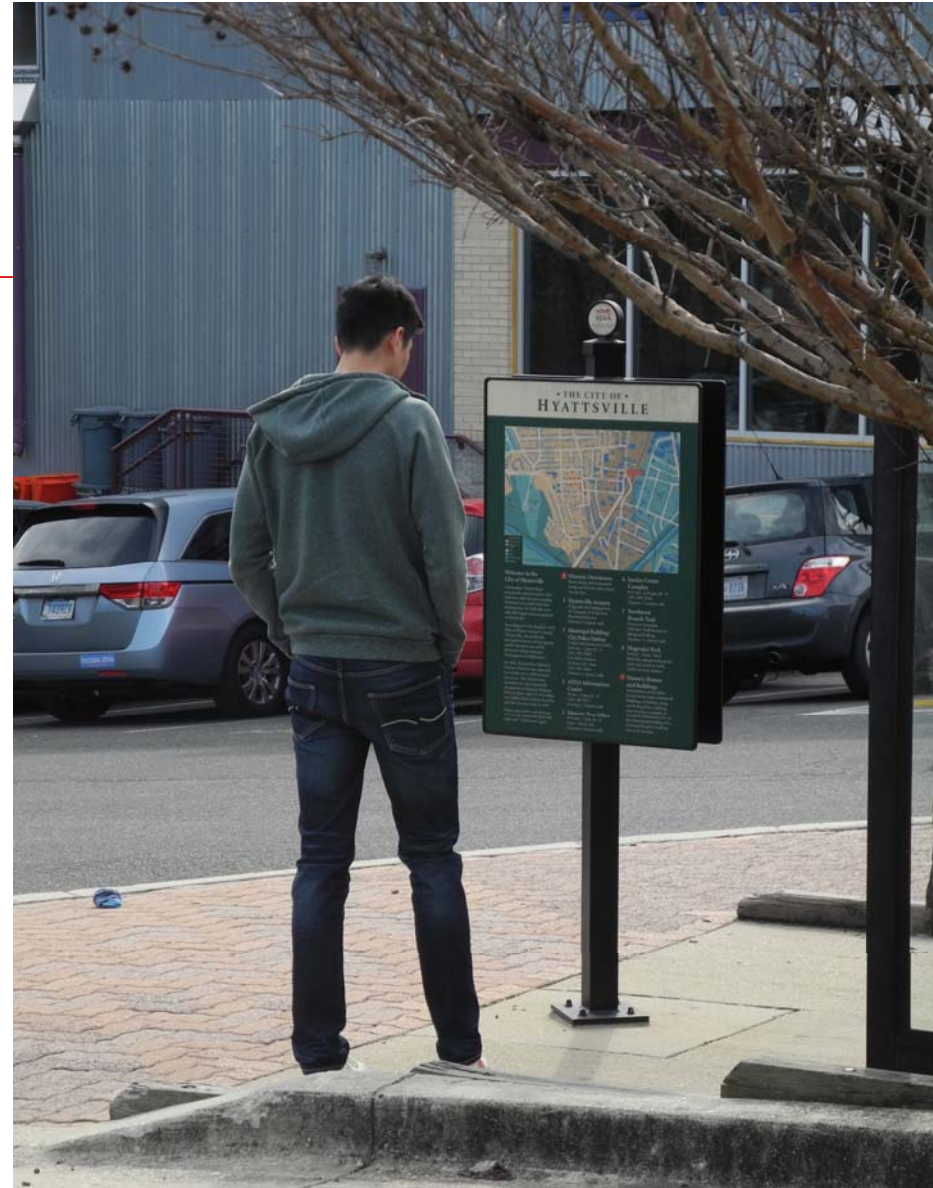
- Project Goals
- Future Needs
- Vision
- Planning Process
- Project Scoring



# Project Goals

- Identify **bicycle** and **pedestrian** needs of the city
- Evaluate existing and future **roadway needs**
- Evaluate **traffic calming** and one-way streets
- Evaluate **parking issues** in target areas
- Prepare a **wayfinding plan**
- Evaluate **school traffic** and infrastructure

Develop implementation-oriented  
Sequential Action Plan





# Future Needs

- **Increasing vehicle traffic** through the City may require revisiting intersection design and signal timing
- **Growing/changing commercial areas** require strategic approach to parking
- **Increasing pedestrian and bicycle traffic** require making the best use of limited space and consideration of community priorities
- **Critical street connections:** Investigate completing missing links and change street circulation





# Vision

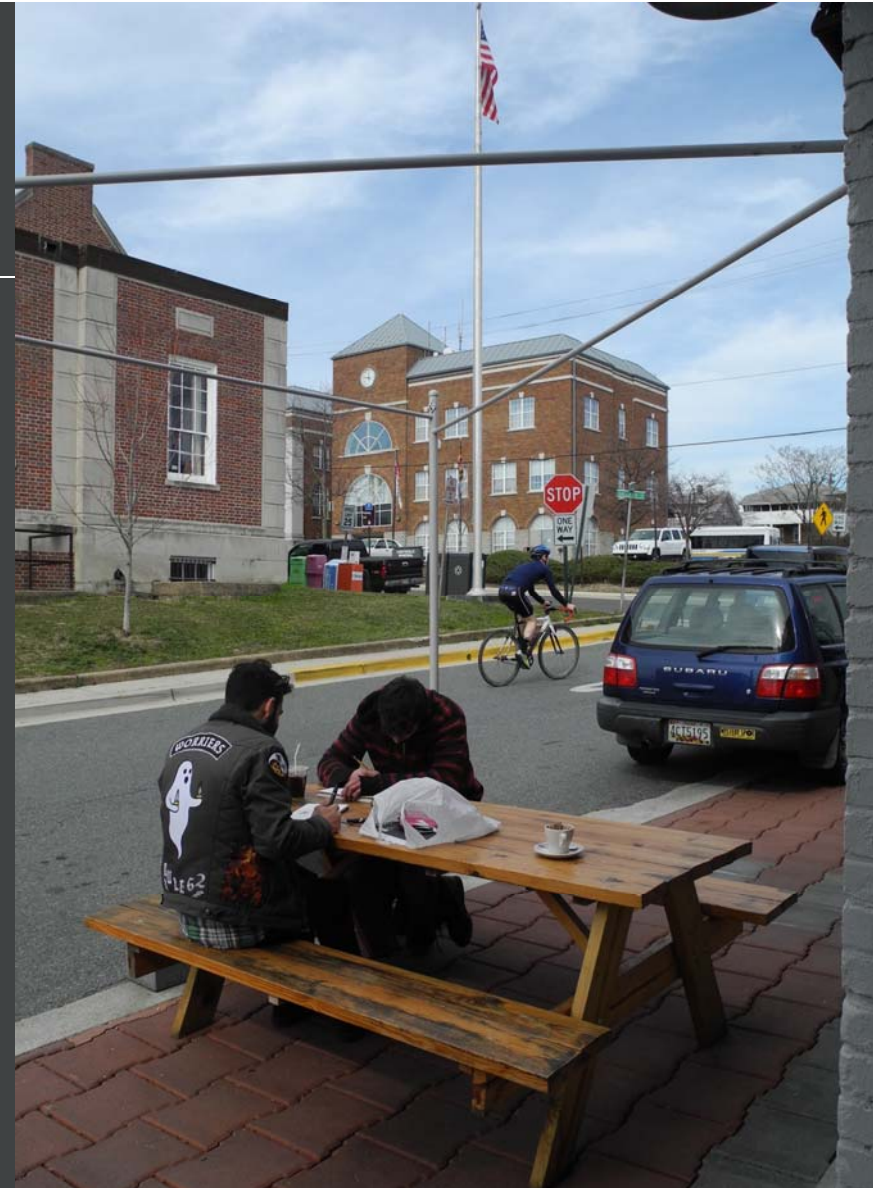
- In the very near future, Hyattsville will be a place where anyone, regardless of age, background, or ability, can travel safely, comfortably, and affordably.
- Its transportation network will prioritize people-friendly streets that add energy and vitality to their surroundings while accommodating the inevitable flow of traffic into and out of the City.

**TOOLE**  
DESIGN



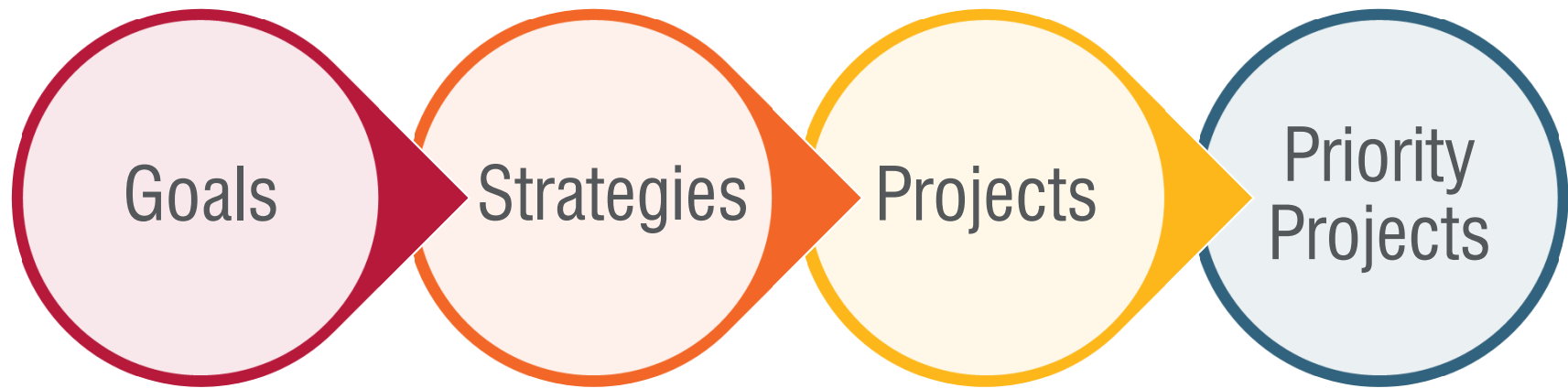
# Vision

- The transportation system will support its sustainability goals, prioritizing active transportation for shorter trips and access to rapid transit for longer trips.
- Hyattsville's streets will serve as the backdrop for community events and festivals, as well as the rhythms of everyday life.



# Planning Process

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# Goals

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## Six Speak Up HVL! Goals

- Improve safety along major roads
- Improve traffic flow within neighborhoods
- Enhance and increase safe connectivity for pedestrians
- Strengthen connectivity for cyclists
- Support development around the Metro stations and Gateway Arts District
- Support environmentally friendly, sustainable growth



# Key Inputs

- Review of previous plans
- Public input
  - Project website
  - Wikimap
  - Several community meetings and events
- Stakeholder conversations
- Field inventory
- Data analysis



# Strategies

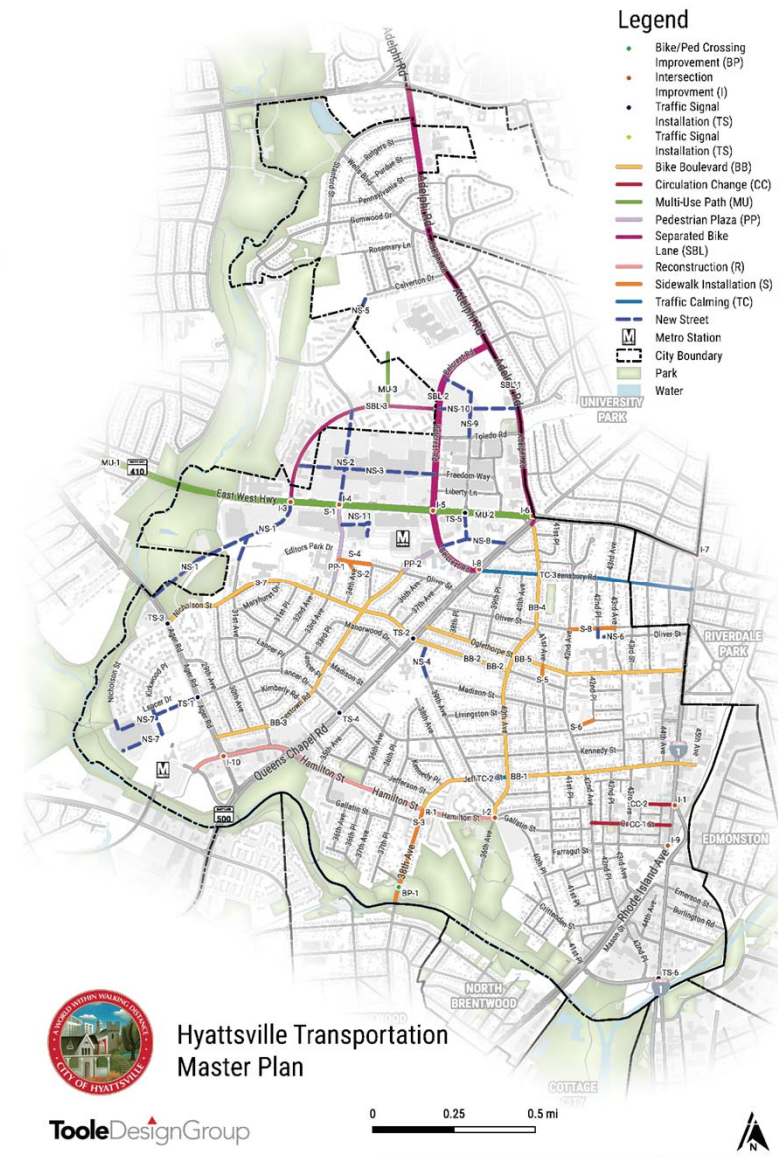
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## Derived from Goals and Key Inputs

1. Design streets for lower speeds
2. Prioritize people on foot in street design
3. Where appropriate, change traffic circulation
4. Prioritize the comfort of people on bikes in street design
5. Design intersections to prioritize local connections
6. Prioritize connections to and from the Metro stations and Arts District
7. Integrate trails into the local transportation network
8. Complete the City's street grid with new street connections

# Recommendation Categories

- Improved trail crossings
- Shared-use paths and sidewalks
- Bike lanes
- Signal timing improvements
- Limited new street connections
- Pedestrian plazas
- New traffic signals



# Project Scoring

- Six Speak Up HVL! Goals, each assigned a point value
- These six principles were used to rate each of 51 proposed projects around the City
- 23-point scale used to score projects

|  | Improve safety on major roads | Safe connectivity for pedestrians | Traffic flow in neighborhoods | Strengthen connectivity for cyclists | Support Metro/Arts District | Sustainable growth |     |
|--|-------------------------------|-----------------------------------|-------------------------------|--------------------------------------|-----------------------------|--------------------|-----|
|  | 4                             | 5                                 | 3                             | 5                                    | 4                           | 2                  | SUM |
|  | 1                             | 0                                 | 1                             | 1                                    | 1                           | 0                  | 16  |
|  | 0                             | 0                                 | 1                             | 1                                    | 1                           | 0                  | 12  |
|  | 0                             | 0                                 | 1                             | 1                                    | 1                           | 0                  | 12  |
|  | 0                             | 0                                 | 1                             | 1                                    | 0                           | 0                  | 8   |
|  | 0                             | 0                                 | 1                             | 1                                    | 0                           | 0                  | 8   |



# Project Scoring

| Speak Up HVL! Goal                                                                                               | Points |
|------------------------------------------------------------------------------------------------------------------|--------|
| Improve safety along major roads                                                                                 | 4      |
| Improve traffic flow within neighborhoods                                                                        | 3      |
| Enhance and increase safe connectivity for pedestrians                                                           | 5      |
| Strengthen connectivity for cyclists                                                                             | 5      |
| Support development around the Metro stations and Gateway Arts District                                          | 4      |
| Support environmentally friendly, sustainable growth<br>(Points assigned if project meets the prior three goals) | 2      |

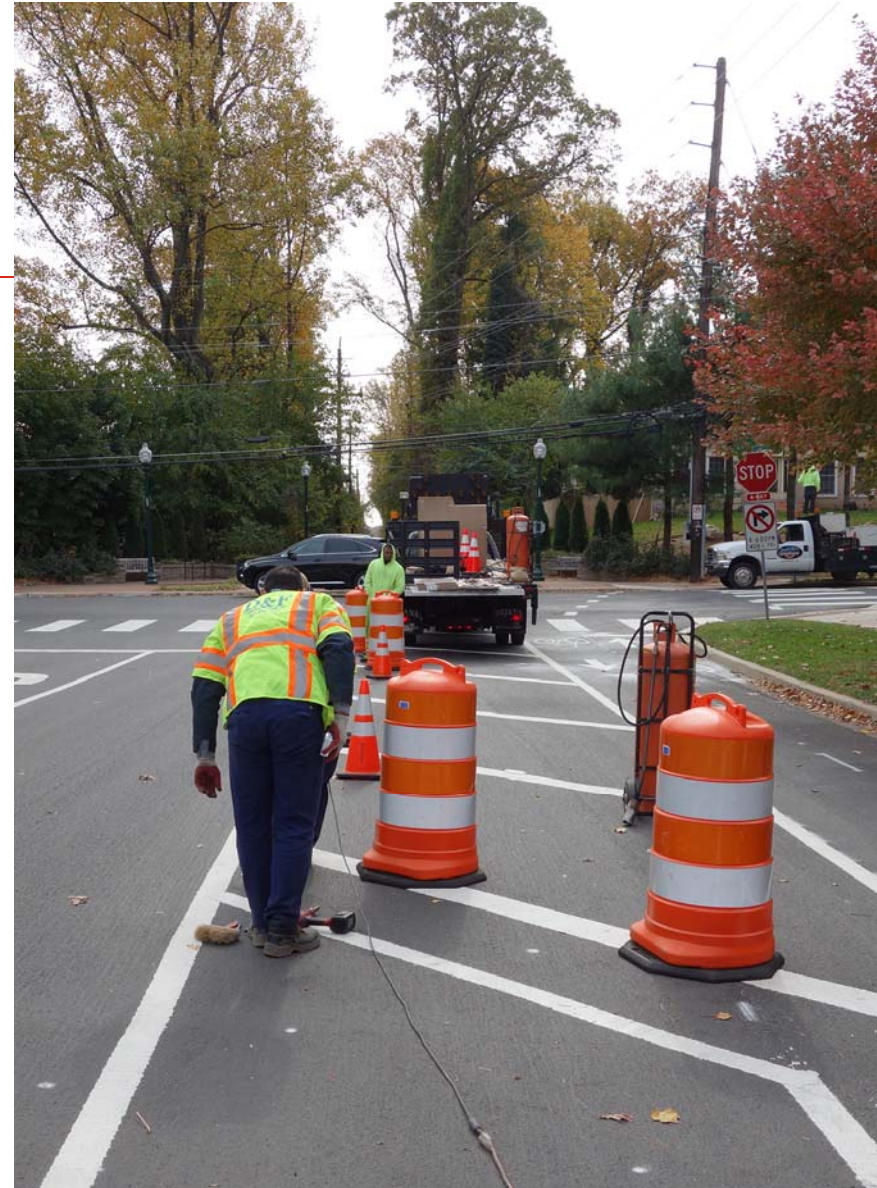
# Sequential Action Plan

- Groups of projects that can be implemented as a package
  - Projects from the same neighborhood
  - Project type (e.g. sidewalks, wayfinding)
  - Key corridor projects with multiple elements
  - Operationally-linked projects (e.g. intersection improvements)



# Next Steps

- Finalize Transportation Study
- Select priority projects for implementation
- Identify and secure funding (local funding, grants, partnerships)
- Collaborate with partners (PG DPWT, MD SHA, MNCPPC-PG, developers, etc.)







# THANK YOU



**TOOLE**  
DESIGN

## City Council Comments on Hyattsville Transportation Study

The recommendations/ideas below were discussed by the City Council at the November 5, 2018 City Council meeting. At that meeting, the Council asked staff to provide a further analysis and reasoning for the following recommendations. The responses below are from both staff and the City's transportation consultant, Toole Design Group.

### BB-5: Bike Boulevard on Oglethorpe Street

City Council/Resident Comments:

- Is Oglethorpe Street the best street for a bike boulevard?
- Since Oglethorpe Street is one-way at certain sections, would making it a bike boulevard ask cyclists to ride against traffic?
- Is Oglethorpe Street too narrow in certain places for cars and bicycles?

Transportation Study Language: "Nearly all of the City is within a comfortable bicycling distance of major destinations, such as the Metro stations, the Prince George's Plaza transit district, or the Gateway Arts District. Most neighborhood streets lack bicycle accommodations but are too narrow to accommodate dedicated bike lanes or would require parking removal for their installation. Many of these streets are ideal for a bike boulevard, which uses signs, pavement markings and traffic calming to create a low-speed street that is comfortable for bicycling. Bike boulevards can also help address speeding and discourage cut-through traffic through traffic calming." (page 35)

Additional Information: Oglethorpe Street is one of the few roads which directly connects Route 1 to Queens Chapel Road. Although it is not a direct cut through for cars as it is a one-way street at some points, but this also means traffic volumes on Oglethorpe Street than on Queensbury Road, making Oglethorpe an ideal bike boulevard candidate. To the best ability possible, bike boulevards should be direct routes, and routing cyclists along Farragut Street or Nicholson Street, for example, would require many turns and could be confusing to those unfamiliar with City streets.

Bicycles are treated as a regular vehicle in Uniform Vehicle Code, so regular rules apply unless signed and marked otherwise. To allow contra-flow travel, special signing and pavement markings will be required. In narrow one-way section of the street, contra-flow advisory bike lane may be a viable option, while maintaining sharrows for bicycles traveling in vehicular travel direction. These design treatments and its impact on safety and operation should be evaluated in detail as part of the implementation of the project.

In the two-way section of the street, designating the street as a bike boulevard does not require separate dedication of the width for bicyclists. Bicyclist will share the same travel lanes as vehicles currently do. In bicycle boulevards, traffic calming treatments are implemented so that the volume and speed of the vehicles are kept below 20 mph and 3000 ADT, respectively. This is to ensure the safety of bicyclists and encourage families to ride on the street.

Although the road may feel narrow in some sections, both with additional traffic calming measures and the fact that bicyclists themselves serve as a traffic calming measure, the width of Oglethorpe is sufficient for a bike boulevard.

### CC-3: Conversion of Farragut Street to two-way from 42nd Avenue to Baltimore Avenue

#### City Council/Resident Comments:

- How will a circulation change impact the intersection of Farragut Street and 42<sup>nd</sup> Avenue? Will turning that intersection into a three-way stop require the removal of parking spaces?
- Will on-street parking need to be removed along Farragut Street in order to accommodate two-way traffic?

Transportation Study Language: “One-way streets are common on Hyattsville’s narrower streets, particularly around the Arts District and in Hyattsville Hills. However, some one-way streets can increase traffic congestion by forcing drivers to take long, circuitous routes, impede travel by not providing a route for a return trip, and even encourage speeding on streets with excess width. Additional discussion about one-way streets and how they relate to the City’s street network can be found in Chapter 5.” (page 35)

Additional Information: As cars can turn westbound onto Farragut Street from Baltimore Avenue to access parking lots and structures for the City and the County, this can be a confusing street to navigate. Many drivers currently do not realize that the road becomes one-way after the entrance to the County Service Building parking garage, leading to conflicts and near collisions. Changing the circulation pattern would improve traffic flow to and from Route 1 and reduce traffic volumes on Gallatin Street (between 42<sup>nd</sup> Avenue and Route 1).

Farragut Street is approximately 26’ wide. Providing 7’ on-street parking on one-side of the street will allow adequate width for two-way traffic in low speed and volume environment. Near intersections, on-street parking in the City is prohibited 30 feet from a stop sign. Currently two of the three “legs” of the intersection in question allow on-street parking. Changes to the intersection would result in the elimination of approximately 4 parking spaces total.

### NS-1: Connection of East West Highway to Ager Road

#### City Council/Resident Comments:

- Concern about impacts of traffic dumping onto Nicholson Street and smaller neighborhood roads in West Hyattsville as a result of this connection.
- Belief that the connection is not necessary, as there are existing routes that can provide access to East West Highway.

Transportation Study Language: “A lack of street connections between East-West Highway, Ager Road, and Queens Chapel Road forces residents on long, circuitous paths to make local trips, encouraging people to drive and generating additional traffic congestion. A new street from the end of Toledo Terrace to Heurich Park Road (or 31st Avenue) will significantly improve traffic flow and circulation, particularly for local trips. The design may require incorporation of traffic calming treatments to ensure that this does not create a new traffic burden on neighborhoods. This connection would require additional analysis and a feasibility study.” (page 32).

Additional Information: Making another street connection from Ager Road to East-West Highway will reduce cut-through traffic on Nicholson Street to access the shops around Prince George's Plaza and

reduce the separating effects of the WMATA metro tracks. It will prevent residents from having to leave the City limits or funnel through the neighborhood to Queen's Chapel Road in order to access the Prince George's Plaza area. This connection is vital for long-term mobility of Hyattsville, is anticipated to dramatically improve travel options in the area and potentially the quality of life for residents. We strongly believe that this project should be considered and studied further for feasibility.

NS-4: Connection of 38<sup>th</sup> to Queens Chapel/Manorwood Drive

City Council/Resident Comments:

- Concern about usage of eminent domain to seize private property to create the connection.
- Concern about traffic impacts to the neighborhood streets.

Transportation Study Language: "Dead-end streets can impede connections for people on foot or bicycle, funnel more traffic onto the streets that do provide through-connections, and reduce accessibility for emergency vehicles. Connecting these broken links could improve access throughout the City and make it easier for people to take short trips by any mode without traveling on already burdened major roads. It is recommended the City undertake a feasibility study of connecting the following dead-end streets:

- Calverton Drive to Dean Drive
- Oliver Street between 42nd Place and 43rd Avenue
- Queens Chapel Road and Manorwood Drive intersection

Furthermore, as large land parcels redevelop in the future, e.g. the Mall at Prince George's or expansion of the University Town Center, the City should consider establishing an urban street grid network to improve multimodal circulation as well as enhance the livability of the area.

It should be noted that in each case, new streets are proposed to preserve right-of-way if or when redevelopment occurs at that location. The City has no intention of seizing private property to construct these roads. New streets are intended to create access to new development, serve new residents and businesses, and improve local traffic for current residents by completing the street grid. They are not intended to encourage cut-through traffic on existing streets. All new streets should be designed to discourage cut-through traffic by incorporating traffic calming devices or via other measures." (page 33)

Additional Information: The lack of continuous east-west connection through Queens Chapel road is a major barrier to provide a connected roadway network in Hyattsville. 38<sup>th</sup> Street to Manorwood Drive connection will provide vital secondary connection for residents of Hyattsville. A future connection of 38<sup>th</sup> Street to Manorwood Drive would better connect residents to neighborhoods and services on the other side of Queens Chapel Road. Currently, if residents wish to cross Queens Chapel, the only options are Lancer Drive or Nicholson Street.

Staff believe that this connection would only occur in a total redevelopment scenario. As this is a long-term project, the alignment of the roadway will likely change, or alternate east-west connection may be viable in the future if/when different parcel develops on either side of Queens Chapel Road. Staff do not foresee, intend, or advocate for utilizing eminent domain to make this, or any other, new roadway connections.

#### NS-5: Connection of Dean Drive to Calverton Drive

##### City Council/Resident Concerns:

- Concern from residents about the road being used as a cut through to bypass Belcrest Road or Adelphi Road.
- Concern about impact to nature and green space.
- Interested in potential of a non-motorized connection.

Transportation Study Language: “Dead-end streets can impede connections for people on foot or bicycle, funnel more traffic onto the streets that do provide through-connections, and reduce accessibility for emergency vehicles. Connecting these broken links could improve access throughout the City and make it easier for people to take short trips by any mode without traveling on already burdened major roads. It is recommended the City undertake a feasibility study of connecting the following dead-end streets:

- Calverton Drive to Dean Drive
- Oliver Street between 42nd Place and 43rd Avenue
- Queens Chapel Road and Manorwood Drive intersection

Furthermore, as large land parcels redevelop in the future, e.g. the Mall at Prince George’s or expansion of the University Town Center, the City should consider establishing an urban street grid network to improve multimodal circulation as well as enhance the livability of the area.

It should be noted that in each case, new streets are proposed to preserve right-of-way if or when redevelopment occurs at that location. The City has no intention of seizing private property to construct these roads. New streets are intended to create access to new development, serve new residents and businesses, and improve local traffic for current residents by completing the street grid. They are not intended to encourage cut-through traffic on existing streets. All new streets should be designed to discourage cut-through traffic by incorporating traffic calming devices or via other measures.” (page 33)

Additional Information: The area northwest of the mall has experienced residential growth. Additionally, there is proposed townhome development and potential annexation involving land south of Northwestern High School. Existing street connectivity in the area is poor. As regional traffic on Adelphi Road is likely to increase in the future in line with regional population growth, reliance on the street to make short local connections will have negative impact on the quality of life of Hyattsville residents. This is a critical connection for residents in the area as it will allow them to by-pass regional traffic on Adelphi and East-West Highway to access the Mall and metro. Without this connection, the traffic on Adelphi and East-West Highway will also increase and contribute to the congestion in the area.

As there is no traffic signal on Calverton Drive and Adelphi Road, the number of cut-through traffic is likely to be limited. If cut-through traffic does become an issue, traffic calming measures or turn restrictions may be implemented to alleviate the concern. The proposed Landy development has three vehicular entry/exit points: one on Northwest Drive, one on Dean Drive, and one on Belcrest Road. In other words, vehicles will have ample ways to access the mall or Adelphi Road without cutting through to Calverton Drive. Furthermore, the connection may also improve the possibility of expanding any future bus circulator in the area.

A non-motorized connection will provide some connectivity in the area. Currently, a resident living in one of the last apartment buildings on Dean Drive would have a 25-minute, 1.2 mile walk to Northwestern High School. A resident living in one of the furthest west properties on Calverton Drive – a property less



than 400 feet away – has only an 8-minute, 0.4 mile walk to the high school. However, as the link is almost 0.6 miles from the Mall and 1.1 miles from the metro station, it will likely not be used by commuters on foot. Bicyclists will likely benefit the most from the non-motorized connection. Conducting a feasibility study to address concerns raised by residents and quantify the impact of the proposed connection is recommended.

### Other Items Brought up at the City Council Meeting

*Is it possible to get a cost estimate for the feasibility study of a new street? The cost estimate in the appendix seems to be for the actual construction, not for a feasibility study.*

Additional Information: The cost provided in the appendix is for the actual construction of a new road. An engineering feasibility study with concept design included will range in cost from \$30,000 - \$100,000 based on the length, context and complexity of the proposed new road.

*Why is no intervention necessary on Quintana Street?*

Additional Information: The street was not identified as a concern during the course of the project. A review of the circulation pattern seems to indicate that the eastbound one-way street on Quintana Street and southbound one-way street on 41<sup>st</sup> Place could be implemented to prevent cut-through traffic in the neighborhood. The City Council should be aware, however, the impacts that would have on residents living in those homes. If 41<sup>st</sup> Place was designated as southbound, one-way, residents of that area would only be permitted to enter through Queen's Chapel Road (onto Quintana Street) or from East West Highway (onto 41<sup>st</sup> Place). There would be no access from the local, neighborhood streets.

*What is the rationale behind no light at Longfellow and Baltimore Avenue? What did Toole see here?*

Additional Information: The project did not collect turning movement counts at the intersection to conduct the analysis. As the closest existing traffic signal is approximately 400 feet to the north on Madison Street, vehicles can use the signal to make safe turning movements. If the intersection experiences excessive delays or safety issues, a signal warrant analysis may be conducted. MDOT is assessing the crossing at Longfellow and considering the installation of a crosswalk and blinking signal to indicate pedestrian traffic. The staff continues to follow-up on that option.

*Do recommendations TS-1 (Lancer Drive & Ager Road traffic signal) or R-1 (Hamilton Street Complete Street Design and Construction) conflict with the Ager Road Green Streets project forecasted by Prince George's County?*

Additional Information: A traffic signal at Ager Road and Nicholson Street was looked into by the County, but at this time they have determined that the intersection does not meet the warrants for a traffic light. As a result, the light is not included in the Green Streets project. Regarding the Jamestown Road sidewalk, it is proposed in the Ager Road project. Staff are recommending that it stay in R-1 as well, knowing that R-1 is a longer-term goal. It is likely that the Ager Road project will be complete before the Hamilton Street redesign, but if it is not, sidewalk improvements on Jamestown should be included in that project.





## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Candace Hollingsworth, Mayor

Submitting Department: Legislative

Item Type: Ordinance

Agenda Section: Discussion Items (9:15 p.m. - 9:45 p.m.)

### SUBJECT

Chapter 8: Citywide Vote-By-Mail for 2021 Election (15 minutes)

### HCC-132-FY19

#### Recommendation:

I move that the Mayor and Council authorize the City Attorney to draft revisions to Chapter 8 necessary to enable the Board of Elections Supervisors to distribute, proactively, a Vote-by-Mail ballot to all registered voters in the City of Hyattsville (on State and city-only registries). I further move that the Mayor and Council appropriate funds necessary to support this effort in the 2021 municipal election.

#### Sponsor(s):

Hollingsworth

#### Co-Sponsor(s):

Lawrence, Suiter, Ward

### ATTACHMENTS

#### Summary Background:

Hyattsville ordinance 2017-01 enabled vote-by-mail in municipal elections upon receipt of a completed application by eligible voters. Additionally, the Hyattsville City Council is currently considering additional revisions to Chapter 8 that will enable the establishment of a permanent vote-by-mail designation that may be revoked (proposed) due to non-participation in three previous city elections or by request of the voter. This revision is requested to further expand democracy by ensuring that every voter in the City of Hyattsville is able to participate in city elections with fewer barriers.

#### Next Steps:

Discussion, determination of feasibility and anticipated costs.

#### Fiscal Impact:

TBD

#### City Administrator Comments:

The Board of Supervisors of Elections is supportive of Vote-by-Mail initiatives, however the Board has not yet had the opportunity to review this proposal. A 2021 implementation date allows the staff and the Election Board to evaluate support requirements and estimated cost.

The Initial evaluation identified the following next steps:

- Identify and recommend code changes
- Identify budget requirements
- Determine coordination needed with Prince George's County Board of Elections
- Determine vendor and equipment needs and process
- Review security plan for mailing/storage of ballots including location of secure room for processing ballots

- Develop a communications strategy
- Identify drop box locations and other standard operating procedures

**Community Engagement:**

TBD

**Strategic Goals:**

Goal 1 – Ensure Transparent and Accessible Governance

**Legal Review Required?**

Pending



## Hyattsville City Council Agenda Item Report

Meeting Date: November 19, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Community Notices

Agenda Section: Community Notices and Meetings

### **SUBJECT**

City Calendar: November 20 - December 3, 2018

**HCC-139-FY19**

### **Recommendation:**

### **Sponsor(s):**

At the Request of the City Administrator

### **Co-Sponsor(s):**

### **ATTACHMENTS**

[Main City Calendar\\_Nov 20 - Dec 3 2018.docx](#)

### **Summary Background:**

N/A

### **Next Steps:**

N/A

### **Fiscal Impact:**

None

### **City Administrator Comments:**

Reviewed

### **Community Engagement:**

N/A

### **Strategic Goals:**

Goal 1 – Ensure Transparent and Accessible Governance

### **Legal Review Required?**

N/A

Main City Calendar: November 20 – December 3, 2018

Weekly Program Offerings

Ageless Grace Senior Exercise Classes

Wednesdays and Fridays, 10:00 AM @ City Municipal Building

Creative Minds

Tuesdays and Thursdays, 10:00 AM @ Magruder Park Recreation Center

Senior Art Class

Tuesdays, 10:30 AM – 12:30 PM @ Art Works Now

The City is offering free senior art classes in partnership with Art Works Now. Seating is limited, and registration is required.

City Calendar: November 20 – December 3, 2018

Board of Supervisors of Elections Meeting

November 20, 2:00 PM – 6:00 PM @ City Building, 2<sup>nd</sup> Floor Pranglely Room

Planning Committee Meeting

November 20, 7:30 PM – 9:30 PM @ City Building, 2<sup>nd</sup> Floor Pranglely Room

Coffee with a Cop

November 27, 8:00 AM – 10:00 AM @ Vigilante Coffee

Ward 1 Check-In

November 28, 6:30 PM – 7:30 PM @ City Building, 2<sup>nd</sup> Floor Pranglely Room

Education Advisory Committee Meeting

November 29, 6:30 PM – 8:00 PM @ City Building, 2<sup>nd</sup> Floor Pranglely Room

Health, Wellness, and Recreation Advisory Committee Meeting

November 29, 7:30 PM – 9:00 PM @ City Building, 3<sup>rd</sup> Floor Mayor's Office

Hyattsville Volunteer Recognition & Appreciation Reception

December 3, 6:00 PM – 8:00 PM @ City Building, 1<sup>st</sup> Floor Multipurpose Room

Public Hearing: Landy Property Annexation

December 3, 7:30 PM – 8:00 PM @ City Building, 3<sup>rd</sup> Floor Council Chambers

Council Meeting

December 3, 8:00 PM – 10:00 PM @ City Building, 3<sup>rd</sup> Floor Council Chambers