

City Council of Hyattsville, Maryland

AGENDA

**City Council Regular Meeting
Monday, December 3, 2018
8:00 PM**



**Council Chambers
Hyattsville Municipal Building
4310 Gallatin Street, 3rd Floor
Hyattsville, MD 20781
(301) 985-5000 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

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 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

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.

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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-169-FY19

I move that the Mayor and Council approve the Council Meeting Minutes for the Regular Council Meeting of May 7, 2018.

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Minutes May 7 2018 FINAL.pdf](#)

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

6. Presentations (8:20 p.m. - 8:40 p.m.)

6.a) FY17 Audit Update (5 minutes)

HCC-166-FY19

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

6.b) Hyattsville Circulator Feasibility Study (15 minutes)

HCC-160-FY19

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[CityCouncilPresentation_CirculatorStudy FINAL.pdf](#)

[Transit Circulator Study Updated Final.pdf](#)

7. Consent Items (8:40 p.m. - 8:45 p.m.)

7.a) Phone System Lease Agreement

HCC-137-FY19

I move that the City Council authorize the City Administrator to execute a lease agreement for voice over IP phone system services with RingCentral, 20 Davis Drive, Belmont, CA 94002. The lease agreement will include a 36-month term, plus two additional 12 month terms and the annual cost will not exceed \$25,000.

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Memo - Phone System Lease Agreement.docx](#)

7.b) FY19 Budget Appropriation: Target Corporation Donation

HCC-148-FY19

I move that the Mayor and Council accept and appropriate into the FY19 budget a donation in the amount of \$1,500 from Target Corporation to the Community Action Team for the purpose of purchasing gift cards for children's use during the City's annual Shop with a Cop event.

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

7.c) FY19 Budget Appropriation: Franklin's Restaurant

HCC-147-FY19

I move that the Mayor and Council accept and appropriate into the FY19 budget a donation in the amount of \$547.20 from Franklin's Restaurant to Community Action Team for the purpose of purchasing gift cards for children's use during the City's annual Shop with a Cop event.

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

7.d) FY19 Budget Appropriation: Aggressive Driving Enforcement Grant Award

HCC-158-FY19

I move that the Mayor and Council amend the FY19 budget to accept and appropriate the grant award in the amount of 2,000 from the Maryland Highway Safety Office for the purpose of providing overtime funding for the enforcement of motor vehicle laws.

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[MD Highway Safety Aggressive Driving.pdf](#)

7.e) Variance Request V-125-18: 3320 Gumwood Drive

HCC-161-FY19

I move that 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-125-18, a zoning variance application for the subject property at 3320 Gumwood Drive, for a zoning variance of five (5) feet front yard depth and a waive of the parking area location requirement.

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[V-125-18 Memo to Council.docx](#)

[V-125-18 Application.pdf](#)

[V-125-18 Statement From Applicant.docx](#)

[City of Hyattsville Zoning Variance Policy Statement & Variance Process ENGLISH.pdf](#)

7.f) University of Maryland Shuttle Program MOU – 2019 Extension

HCC-164-FY19

I move the City Council authorize the City Administrator to execute a MOU extension with University of Maryland Department of Transportation Services for the purpose of continuing the City's participation in the UMD Shuttle program through December 31, 2019 at a cost not to exceed \$6,000.

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Memo - UMD Shuttle MOU Extension - 11.28.2019.docx](#)

7.g) Red Light Camera Contract - Annual Renewal**HCC-159-FY19**

I move that the Mayor and Council authorize the City Administrator to renew the City's agreement with Verra Mobility to provide digital camera traffic enforcement services, related citation management and back office processing for the Red Light Camera Program for 2019.

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[HYATTSVILLE Amendment Renewal.docx](#)

[Memo to Tracey Nicholson.docx](#)

8. Action Items (8:45 p.m. - 9:20 p.m.)**8.a) Hyattsville Ordinance 2018-06, Repeal and Replace Chapter 8, Elections (5 minutes)****HCC-150-FY19**

I move that the Mayor and Council adopt 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. (SECOND READING/ADOPTION).

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Chapter 8 Revisions 11.15.18.pdf](#)

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

I move that the Mayor and Council adopt 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. (SECOND READING/ADOPTION).

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Chapter 10 Revisions 10.11.18.pdf](#)

8.c) Hyattsville Ordinance 2018-08: Adoption of Ordinance to Authorize General Obligation Debt for the Public Works Facility and 3505 Hamilton Street (5 minutes)**HCC-125-FY19**

I move that the Mayor and Council adopt Hyattsville Ordinance 2018-08 authorizing the issuance of (1)(A) general obligation bonds and (B) general obligation bond anticipation notes, each in an original aggregate principal amount not exceeding Thirteen Million Eight Hundred Twenty-Five Thousand Dollars (\$13,825,000), and (2) general obligation refunding bonds, provided that the original aggregate principal amount of any series of refunding bonds shall not exceed one hundred thirty percent (130%) of the aggregate principal amount of the bonds refunded. The proceeds of the sale are to be used and applied for the public purpose of financing, reimbursing or refinancing costs (as defined in the ordinance) of the projects identified as Public Works Facility, 3505 Hamilton Street and Cost of Issuance. In accordance with applicable budgetary procedures or law the authorized bonds, bond anticipation notes and refunding bonds shall be sold at private sale, unless by resolution City Council provides for the sale of the obligations by another permissible manner. The full faith and credit and unlimited taxing power are pledged to the prompt payment of debt service on each series of the obligations. Details of any series of the obligations shall be determined or provided by resolution of the City Council (SECOND READING/ADOPTION).

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[HO 2018-08 Bond Ordinance.docx](#)

8.d) Hyattsville Transportation Study (20 minutes)

HCC-163-FY19

I move that the City Council adopt the 2018 Hyattsville Transportation Study, the study shall serve as the City's transportation policy and action plan, guiding the City of Hyattsville's prioritization of transportation infrastructure investment.

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Transportation Study Adoption Memo 1.docx](#)

[Final Report HVL 112918.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](#)

9. Council Dialogue

10. Community Notices and Meetings

10.a) City Calendar: December 4 - December 17, 2018
HCC-162-FY19

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s):

[Main City Calendar Dec 4 - Dec 17 2018.docx](#)

11. Motion to Adjourn



Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018
Submitted by: Laura Reams
Submitting Department: City Clerk
Item Type: Legislative
Agenda Section: Approval of the Minutes

SUBJECT

Approval of the Minutes

HCC-169-FY19

Recommendation:

I move that the Mayor and Council approve the Council Meeting Minutes for the Regular Council Meeting of May 7, 2018.

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

[Minutes May 7 2018 FINAL.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



REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD MAY 7, 2018

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 arrived at 7:51 p.m.
Paula Perry, W4 arrived at 7:47 p.m.
Erica Spell, W5

Absent: Joseph Solomon, W5

Also present were the following City staff members:

Tracey Nicholson, City Administrator
Jim Chandler, Assistant City Administrator & Director of Community & Economic Development
Douglas Holland, Chief of Police
Ron Brooks, City Treasurer
Lesley Riddle, Director of Public Works
Vivian Snellman, Director of Human Resources
Laura Reams, City Clerk
Nicola Konigkramer, Deputy City Clerk
Lillie Littleford, Assistant City Clerk
Katie Gerbes, Community Planner

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

Mayor Hollingsworth called the meeting to order at 7:38 p.m.

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

3) **Approval of Agenda**

The agenda was approved with the following amendments.

1. Remove Item 8.A (Schedule Public Hearing) and 8.B (Schedule Regular Council Meeting) from the Consent Agenda to the Action Agenda.

2. Add the following motion to the Action Agenda: Motion # **HCC-328-FY18** I move that the Mayor and Council modify the March 22, 2018 memorandum to the Prince Georges County Planning Board regarding the proposed Sacred Heart Development and state for the record the concerns communicated in the petition to the Hyattsville City Council dated March 29, 2018.

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

4) **Approval of the Minutes**



REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD MAY 7, 2018

- 4.a Approval of the Minutes
HCC-291-FY18
I move that the Mayor and Council approve the Council Meeting Minutes for the Regular Council Meetings of February 5, 2018 and April 2, 2018.

Cover Page

Minutes_Feb 5 2018_Final.pdf

Minutes_Apr 2 2018.pdf

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

5) Public Comment (7:40 p.m. – 8:15 p.m.) Limit 2 minutes per speaker

Police Chief Douglas K. Holland announced his retirement from the Hyattsville Police Department.

Sgt. Zach Nemser, on behalf of the Hyattsville FOP Lodge 119 thanked Police Chief Holland for 19 years of leadership of the Hyattsville Police Department.

Police Captain Amal Awad, on behalf of the Hyattsville Police Department stated appreciation for Police Chief Holland.

Jaime Garay, a Ward 2 resident, stated opposition to the Sacred Heart development project, citing a loss of trees and proximity of the development to residential homes.

Sandra Isabel Rodriguez, a Ward 2 resident, cited concern with the public notification process for the Sacred Heart project and suggested establishing procedures for public input on development projects.

Carmen Maldonado, a Ward 2 resident, stated opposition to the Sacred Heart project, citing concerns with the proximity of the project to the neighborhood and a loss of trees.

Mary Graham, a Ward 2 resident, addressed the Mayor and Council on the Sacred Heart project. Ms. Graham stated concern with development in Hyattsville proceeding quickly and urged greater public participation in development projects.

Jacqueline Kittrell, a Ward 2 resident, said she did not receive notification of the Sacred Heart project and she was concerned the proposal may negatively affect quality of life in the community.

Brenda Russell, a Ward 2 resident, also cited concern with the notification process for the Sacred Heart development. Ms. Russell also stated concerns with possible pollution run off and the loss of trees.

Dan Muth, a Ward 1 resident, stated opposition to the Magruder Pointe development. Mr. Muth expressed concern with the public engagement process and suggested that town hall style meetings may allow for more productive dialogue.

Larry Talb, Attorney for the Sacred Heart development project provided information on the legally required notification process and details on the project scope.



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Sister Vacha Kludziak, Administrator of Sacred Heart Home said building renovations were necessary to provide quality care to the residents of Sacred Heart.

Jozef Przygodzki, a Ward 2 resident, stated opposition to the Magruder Pointe development and the modification to the table of uses.

Sarah Harper, a Ward 2 resident, stated opposition to the Magruder Pointe development. Ms. Harper cited concern with the affordability of the homes, conservation of the park, and capacity of the elementary school.

Melissa Jackson, a Ward 2 resident, stated opposition to the Magruder Pointe development. Ms. Jackson quoted statements from an online petition opposing the development and provided the City Clerk with a copy.

Shawn Brown, a Ward 2 resident, stated opposition to the Sacred Heart development, citing concerns with notification, loss of trees and green space, and the addition of an access road on the property.

Michelle Roberts, a Ward 2 resident, stated opposition to the Sacred Heart project. Ms. Roberts reiterated concerns with the notification process, loss of trees, and the proposed access road.

Stephanie Jarvais, a Ward 2 resident, stated opposition to the Magruder Pointe development, citing concern with the loss of park space and potential overcrowding in schools.

Nina Faye, a Ward 3 resident, stated opposition to the Magruder Point development. Ms. Faye cited flood plain, zoning, and density concerns.

Greg Smith, a Ward 1 resident, stated opposition to the Magruder Pointe development. Mr. Smith urged the Council to preserve the land for public use.

Anthony Murphy, a Ward 2 resident, addressed the Mayor and Council in favor of the Sacred Heart development noting the need for upgraded facilities.

Jennifer Bosworth, a Ward 2 resident, stated opposition to the Magruder Pointe development. She encouraged the Council to support smart development.

Marisa Johnson, a Ward 1 resident, stated opposition to the Magruder Pointe development. Ms. Johnson provided information on the table of uses and cited concerns with the staff memo.

Nelson Minnick, a Ward 2 resident, addressed the Mayor and Council regarding the Sacred Heart development. He said that while the design was attractive, he was concerned with the proximity to homes, potential noise from service trucks, and a loss of trees.

Will Crick, a Ward 2 resident, stated opposition to the Sacred Heart development, citing concern with the notification process and a change in neighborhood character.

Amanda Eisen, a Ward 2 resident, stated opposition to the Magruder Pointe development. Ms. Eisen cited concern with growth outpacing resources and infrastructure and building in a flood plain.

Jen Hanna, a Ward 2 resident, stated opposition to the Magruder Pointe development citing the impact on the park and Hyattsville Elementary School.



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Jamila Larson, a Ward 1 resident, stated opposition to the Magruder Pointe development and the proposed rezoning. She urged the Council to preserve the public space and consider the environmental impact.

Tim Davis, a Ward 1 resident, stated opposition to Magruder Pointe development and urged the Council to preserve open space.

James Danley, a Ward 2 resident, addressed the Mayor and Council in favor of the Magruder Pointe development. He cited the condition of the existing WSSC building and said proposed alternatives were unworkable or unrealistic.

Barbara Bancroft, a Ward 1 resident, stated opposition to the Magruder Pointe development and urged the Council to preserve open space. She also suggested establishing a citizen committee.

Marci LeFerve, a Ward 2 resident, stated opposition to the Magruder Pointe development and a change in zoning for the property.

Patrick Paschall, a Ward 3 resident, addressed the Mayor and Council regarding the May 2017 election. Mr. Paschall cited concerns with ongoing campaign finance violations, an error in the existing law, and a lack of transparency.

Nick Harris, a Ward 2 resident, addressed the Mayor and Council in favor of the Magruder Pointe development. He noted that the property was not public land and the School Board had not expressed interest in acquiring the property.

6) **Consent Items (9:30 p.m. – 9:35 p.m.)**

6.a Hyattsville Resolution 2018-03: Urban Investment Partners – SGIF Application to Maryland DHCD

HCC-296-FY18

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the Mayor and Council adopt Hyattsville Resolution 2018-03, a Resolution of the City of Hyattsville, Maryland in support of the City's application to the State of Maryland Department of Housing & Community Development (DHCD) for grant funding to support the redevelopment of the 5320-5334 block of Baltimore Avenue, Hyattsville, to be further described in the application to the State of Maryland.

[Cover Page](#) 

[Memo - SGIF Request UIP .doc](#) 

[Hyattsville Resolution - 2018-03.doc](#) 

[The Armory Apartments - Strategic Demolition Fund - Request for City Support.pdf](#) 

[SGIF Fact Sheet.pdf](#) 

6.b Lease Finance and Purchase of Police Vehicles and Related Equipment ID-675-16

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the Mayor and Council amend the Motion ID-675-16, adopted on March 19, 2018 to authorize the City Administrator to execute a lease finance agreement with Tax-Exempt Leasing Corp in an amount not to exceed \$367,712 at a rate of 3.80% for five years to finance the lease purchase of eight police vehicles and related equipment approved in the FY-2018 Capital Improvement Plan and upon legal review and approval by the City Attorney.



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- 6.c Memorandum of Agreement: NWHS School Resource Officer**
HCC-311-FY18
Lead Sponsor: At the Request of the City Administrator
Co-Sponsor(s): N/A
I move that the Mayor and Council approve a Memorandum of Agreement with Prince George's County for the assignment of one (1) School Resource Officer to Northwestern High School for a term ending on June 30, 2020.

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[SRO_Memorandum_of_Agreement.pdf](#)

- 6.d Proclamation of Peace Officers Memorial Day and National Police Week**
HCC-314-FY18
Lead Sponsor: At the Request of the City Administrator
Co-Sponsor(s): N/A
I move that the Mayor and Council proclaim May 15, 2018, to be Peace Officers Memorial Day and the week of May 13 through May 19, 2018, to be National Police Week in the City of Hyattsville.

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[PeaceOfficers_Memorial_Day___National_Police_Week_2018.docx](#)

- 6.e Proclamation of Municipal Clerks Week**
HCC-316-FY18
Lead Sponsor: At the Request of the City Administrator
Co-Sponsor(s): N/A
I move that the Mayor and Council proclaim the week of May 6 through May 12, 2018, to be Municipal Clerks Week in the City of Hyattsville.

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[Municipal_Clerks_Week_2018.docx](#)

- 6.f Proclamation of Children's Mental Health Awareness Day**
HCC-317-FY18
Lead Sponsor: At the Request of the City Administrator
Co-Sponsor(s): N/A
I move that the Mayor and Council proclaim May 10, 2018, to be Children's Mental Health Awareness Day in the City of Hyattsville.

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[Childrens Mental Health Awareness Day 2018 \(AD Edits\).docx](#)

- 6.g Proclamation of Asian-Pacific American Heritage Month**
HCC-318-FY18
Lead Sponsor: At the Request of the City Administrator
Co-Sponsor(s): N/A
I move that the Mayor and Council proclaim May 2018 to be Asian-Pacific American Heritage Month in the City of Hyattsville.

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[Asian-Pacific_American_Heritage_Month_2018.docx](#)

- 6.h Proclamation of Citizenship Celebration Day**
HCC-322-FY18



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Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the Mayor and Council proclaim May 5, 2018, as Citizenship Celebration Day in the City of Hyattsville.

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[Citizenship_Day_Celebration_2018.docx](#)

**6.i Appointment to Code Compliance Advisory Committee
HCC-322-FY18**

Lead Sponsor: Perry

Co-Sponsor(s): N/A

I move that the Mayor and Council appoint Jennifer Brandi (Ward 1) to the Code Compliance Advisory Committee for a term of 2 years, ending on May 7, 2020.

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[Committee Application_Brandi.pdf](#)

**6.j Maryland DHCD Neighborhood BusinessWorks - Letter of Support
HCC-323-FY18**

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the City Council authorize the Mayor to send a letter in support of Will's Home Decorating loan application to the Maryland DHCD Neighborhood BusinessWorks program.

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[Memo - NBW Letter of Support 4.30.2018.doc](#)

[Maryland DHCD - NBW Factsheet.pdf](#)

**6.k Zoning Variance Request V-224-17: 5603 30th Avenue, Hyattsville
HCC-324-FY18**

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the City Council authorize the Mayor to send correspondence to the Prince George's County Board of Zoning Appeals stating the City of Hyattsville's support for Variance Request V-224-17, for a waiver of the front yard depth and net lot coverage for the subject property 5603 30th Avenue, Hyattsville.

[Cover Page](#)

[V-224-17_Memo](#)

[V-224-17 Plat.pdf](#)

[V-224-17 Photos with Measurements.pdf](#)

[V-224-17_Letter_redacted](#)

[City of Hyattsville Zoning Variance Policy Statement and Variance Process 10 3 11.pdf](#)

**6.l FY18 Budget Amendment: Bigbelly Contact Budget Amendment
HCC-325-FY18**

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the Mayor and Council amend the FY-2018 Solid Waste Division operating budget in contracted services to accommodate for the Bigbelly contract, NTE \$50,000.

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**6.m DSP-17054 and SP-17001: Mama's Care Congregate Living Center
HCC-315-FY18**



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Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the Council authorize the Mayor to draft a letter to the Prince George's County Planning Board stating the City's support of detailed site plan application DSP-17054 and special permit application SP-17001 without any conditions.

[Cover Page](#)

[Mamas_Care_Action_Memo.docx](#)

[Planning Committee Minutes - 04.17.2018.doc](#)

6.n **Acceptance of Petition - Sacred Heart Home HCC-328-FY18**

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the Mayor and Council accept a petition received April 30, 2018, from the residents of Clearwood, Castle Manor, and Hyattsville Hills (Wards 2 and 5) regarding the proposed Sacred Heart Home Project.

[Cover Page](#)

[Sacred_Heart_Petition_Redacted.pdf](#)

6.o **Automated License Plate Reader (ALPR) – Award of Contract HCC-309-FY18**

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the Mayor and Council accept the proposal submitted by PCS Mobile, 1200 West Mississippi Avenue, Denver, CO 80223, and authorize the City Administrator to execute a lease agreement for two (2) automated license plate reader units, associated licensing and integration licensing as a monthly subscription-based lease for a 60-month term, not to exceed 66-months, at a cost of approximately \$1,700 per unit, per month.

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[Memo - ALPR Services RFP.docx](#)

[PCS Mobile Complete Brochure_hi res.pdf](#)

[18_0423_Hyattsville_pricing_AutoVu_Single System_Hosted Server_V4 BAFO.pdf](#)

[EN-Genetec-AutoVu-SharpX-Specifications-Sheet \(1\).pdf](#)

[spec_sheet_f110_g4_v4m09y17 \(1\).pdf](#)

6.p **Hyatt Park Placemaking Project HCC-326-FY18**

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the Mayor and Council accept the Hyatt Park Placemaking Project Design Concept and authorize the Mayor to send a letter to the Maryland-National Capital Park & Planning Commission requesting an amendment to the Hyatt Park Joint Use Agreement to permit the City to proceed with the improvements specified in the project design.

[Cover Page](#)

[Memo_-_Public_Placemaking_-_Hyatt_Park_5.1.2018.docx](#)

[Hyatt Park Presentation 20180416.pdf](#)

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Haba
SECONDER:	Lawrence
AYES:	Hollingsworth, Haba, Ward, Lawrence, Croslin, Warner, Suiter, Wright, Perry, Spell



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NAYS:	None
ABSENT:	Solomon

7) Motion to Close (8:15 p.m. - 8:45 p.m.) Times are approximate.

7.a Motion to Close
HCC-306-FY18

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

I move that the Mayor and Council close the Council Meeting of May 7, 2018 in order to consider the acquisition of real property.

This session will be closed under the authority of the Annotated Code of Maryland State Government General Provisions Article Section 3-305(b) (3) to consider the acquisition of real property for a public purpose and matters directly related to the acquisition.

Cover Page

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

Pursuant to the requirement of the Annotated Code of Maryland State Government Article 3-104(1)(2); this statement is included in these minutes:

A closed session of the Council of the City of Hyattsville was held at 9:06 p.m. on Monday, May 7, 2018, in the City of Hyattsville Municipal Building, Third Floor Council Chambers.

In addition to the City Council, the following staff members were present: **Tracey E. Nicholson, City Administrator; Jim Chandler, Assistant City Administrator; Ron Brooks, City Treasurer; Lesley Riddle, Director of Public Works; Laura Reams, City Clerk; and E.I. Cornbrooks IV, City Attorney.**

The authority under which the session was closed was the Annotated Code of Maryland State Government General Provisions Article Section 3-305(b) (3) to consider the acquisition of real property for a public purpose and matters directly related to the acquisition.

Topics Discussed: The Council considered an acquisition offer from Werrlein Properties for property located within the City.

Action Taken: Councilmember Warner moved that the Mayor and Council accept the Letter of Intent from Werrlein Properties, LLC and authorize the City Administrator and City Attorney to draft a Purchase Agreement for the acquisition of Parcels 'A' and 'B'. The motion was seconded by Councilmember Croslin.

RESULT:	FAILED [3-6-1]
MOVER:	Warner
SECONDER:	Croslin
AYES:	Croslin, Warner, Suiter
NAYS:	Hollingsworth, Ward, Lawrence, Wright, Perry, Spell
ABSTAIN:	Haba



REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD MAY 7, 2018

ABSENT:	Solomon
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The Council returned to open session on a motion made by Councilmember Perry, seconded by Council Vice President Ward and approved unanimously at 9:53 p.m.

8) **Presentations (8:45 p.m. – 9:30 p.m.)**

8.a) FY-2016 and FY-2017 Audit Update

HCC-104-FY18

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Cover Page](#)

Treasurer Brooks provided an update for the FY16 and FY17 Audits, noting a mid-July anticipated completion date for FY16.

8.b) FY19 Five Year Forecast

HCC-294-FY18

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Cover Page](#)

Treasurer Brooks presented the FY19 Five Year forecast, as required by City Charter. He summarized the document, highlighting the revenue and expenditure assumptions.

8.c) DSP-17044: Riverfront at West Hyattsville Architecture Plan

HCC-313-FY18

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Cover Page](#)

[DSP-17044 Presentation Memo.docx](#)
[Hyattsville TH Presentation_v3_final.pdf](#)

Assistant Administrator Chandler introduced the Riverfront at West Hyattsville development team and briefly summarized the project. Bobby Gilbane, Vice President of Gilbane Development Company updated Council on the project status and reviewed the site plan consisting of 183 urban style townhomes and park area with an amphitheater.

Councilmember Wright thanked the Gilbane team and said he was excited for the project. He inquired on next steps. Assistant Administrator Chandler said the project would come before the Planning Committee on May 15 and return to Council for action in June. Council President Haba asked if there would be an opportunity for resident feedback. Councilmember Spell inquired about the availability of public parking for the development. Mr. Gilbane noted that public parking was provided at the rear of the site, near the park, and noted previous community meetings on the project.

8.c) PPS 4-17025 Hyatt View

HCC-319-FY18

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

[Cover Page](#)



REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD MAY 7, 2018

[Presentation Memo.docx](#)
[Hyatt View Presentation.pptx](#)
[A-VAR-4-17025.pdf](#)

Assistant Administrator Chandler introduced the Hyatt View presentation and provided background on the project status stating that an administrative error by Maryland National Capital Park and Planning (M-NCPPC) had delayed the project referral request to the City. He anticipated the Council taking action on the item on May 21.

Alan Rahimi, Property Owner and Applicant presented the proposal for eight (8) townhomes. He summarized the site plan, reviewed elevations drawings, and noted features of the homes. Mr. Rahimi noted the project required a variance to reduce the required public utility easement width.

Councilmember Lawrence asked if proposed parking on 44th Avenue would require Council action for the existing residential parking zone. Assistant City Administrator Chandler said staff would review the parking requirements, noting setback requirements from the curb and the nearby stop sign. Mayor Hollingsworth asked how the team arrived at the architectural style choices. Mr. Rahimi said they wanted to give the development a distinctive, upscale look and the mansard roof design provided better space utilization on the 4th floor. Mayor Hollingsworth agreed the architecture was distinctive and stated concern with the orientation of the site. She also asked for clarification on parking and alleyway. Mr. Rahimi said there was parking for two (2) cars per unit.

Council President Haba asked for details on the variance request and if the project would be viable if the request was denied. Mr. Rahimi said the variance was to reduce the public utilities easement from 10 feet to 5 feet, consistent with existing utilities. He said a denial of the variance would result in a reduced size of the building. Council President Haba also inquired about the proposed landscaping. Mr. Rahimi said the landscaping would be similar to the EYA development.

9) Action Items

9. c. [Memorandum to Prince George's Planning Board Regarding Sacred Heart Development](#)
[I move that the Mayor and Council modify the March 22, 2018 memorandum to the Prince Georges County Planning Board regarding the proposed Sacred Heart Development and state for the record the concerns communicated in the petition to the Hyattsville City Council dated March 29, 2018.](#)
[HCC-328a-FY18](#)

Mayor Hollingsworth acknowledged the receipt of a petition from the residents regarding the proposed Sacred Heart Home Project. She summarized the project timeline and outreach, stating that the Council had taken a position before residents initiated the petition. Mayor Hollingsworth concluded that there was a need to modify the intent of the Council correspondence to M-NCPPC to include resident concerns articulated in the petition. Mayor Hollingsworth also said the circumstances of the Sacred Heart project had revealed a weakness in the City's planning and development process. She said the City would modify and expand its notification process and include environmental assessment into future project reviews.

Council President Haba concurred with Mayor Hollingsworth's assessment and recommendation on the City's planning review process. Regarding the City's correspondence to M-NCPPC, he asked if Council was changing its original position of support for the project. Mayor Hollingsworth cited a sentence in the original correspondence which stated that the project had minimal impact to residents. She suggested removing the sentence and including a copy of the petition with the correspondence in order to convey the concerns. The Council supported Mayor Hollingsworth's suggestion and discussed the specific edits to the letter.



REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD MAY 7, 2018

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

- 9.a Schedule Public Hearing for Revitalization Tax Credit Application: Riverfront at West Hyattsville
I move that the Mayor and Council schedule a Public Hearing for May 14, 2018 at 7:30 p.m. to receive public testimony regarding a request by the Gilbane Development Company for the City to consider a revitalization tax credit applied to 100% of real property taxes for multi-family dwellings as part of the Riverfront at West Hyattsville Development.

HCC-307-FY18

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

Cover Page 

Hyattsville 108-4 Revitalization Tax Credit.pdf 

Councilmember Warner said she would vote in opposition because she was unable to attend the Public Hearing or the Council Meeting on May 14.

RESULT:	APPROVED [8-2]
MOVER:	Haba
SECONDER:	Ward
AYES:	Hollingsworth, Haba, Ward, Lawrence, Croslin, Suiter, Wright, Spell
NAYS:	Warner, Perry
ABSENT:	Solomon

- 9.b Schedule Regular Council Meeting for May 14, 2018
I move that the Mayor and Council schedule a Regular Council Meeting to be held on Monday, May 14 at 8:00 p.m.

HCC-308-FY18

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

Cover Page 

2018 Council Meeting Calendar_REVISED MAY 7 2018.docx 

RESULT:	APPROVED [8-2]
MOVER:	Haba
SECONDER:	Ward
AYES:	Hollingsworth, Haba, Ward, Lawrence, Croslin, Suiter, Wright, Spell
NAYS:	Warner, Perry
ABSENT:	Solomon

10) Discussion Items (9:35 p.m. – 10:35 p.m.)

- 10.a CSP-18002: Magruder Pointe (60 minutes)
Discussion Only

HCC-320-FY18

Discussion Only



REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD MAY 7, 2018

Lead Sponsor: At the Request of the City Administrator

Co-Sponsor(s): N/A

Cover Page

CSP_Discussion_Memo_FINAL.docx

CSP-18002.pdf

SOJ CSP-18002.pdf

Zoning Map.PNG

Character Area Map.PNG

TRN Summary.PNG

TRN Goals and Recommendations.pdf

Sec._27_548.19.____Introduction.doc

Table of Uses - Residential TRN.pdf

Planning Committee Minutes - Adopted - 02.27.2018.pdf

Planning Committee Minutes - 03.20.2018 Pending.pdf

Assistant Administrator Chandler opened the discussion noting no new materials and said staff intended bring the item back for action on May 21. Councilmember Wright verified that the question before the body was regarding the amendment to the table of uses. Assistant Administrator Chandler concurred, noting that the Detailed Site Plan (DSP) or Subdivision Plan were not before the Council yet.

Councilmember Wright asked a series of process questions. Planner Gerbes opinioned on why the applicant had proceeded with a request to amend to the table of uses as opposed to a rezoning request. Councilmember Wright said he did not think the project was in line with other Traditional Residential Neighborhood (TRN) Table of Use amendments and the applicant should provide evidence that the proposed use was aligned with the TRN character area goal. Councilmember Wright added that from his perspective, the proposal did not meet the intent or spirit of the neighborhood character area to foster and promote an artist community. Councilmember Wright concluded that although if granted, an amendment to the Table of Uses would be site specific, he was uncomfortable with setting a precedent and amendments to the Table of Use should be taken lightly. Planner Gerbes summarized instances where amendments to the table of uses in the Gateway Arts District had been permitted for uses such as bed and breakfasts, music studios, and vehicle service stores. Assistant Administrator Chandler noted practical challenges with the Gateway Arts District Plan.

Councilmember Suiter thanked staff for their work and residents for participating in the discussion. She said it would be helpful to have clarification from Prince George's County Public Schools on their position regarding the use of the property for a school. Councilmember Warner noted challenges with the site, acknowledged the community's strong emotions, and summarized some of the previous proposals for the site. She also requested clarification on the possibility of using the site for a County school. Councilmember Warner concluded that she was leaning toward opposition.

Council President Haba reiterated the requests from Councilmembers Warner and Suiter to get an official position from Prince George's County Public Schools on the site. He also requested historical information on previous proposals submitted for the site. Councilmember Lawrence said he was concerned about asking staff to track down historical info and noted that past proposals were not relevant to the question before the Council. Mayor Hollingsworth said she would reach out to the Director of Capital Programs for Prince George's County Public Schools to host a community meeting on school facilities. While she was hopeful the meeting would occur soon, she noted that the school facility piece was a separate topic. Mayor Hollingsworth asked how difficult it would be to pull information on previous site proposals. Assistant City Administrator Chandler said staff would pull records on file for Council review. Council President Haba clarified that the request was for background and to see if the County had taken an official position on the site. Mayor Hollingsworth said her request to the Director of Capital Programs would ask for an official



REGULAR MEETING OF THE CITY COUNCIL, HYATTSVILLE MD MAY 7, 2018

position. Councilmember Perry relayed information on a past proposal for a private school on the site. She said the proposal ended because the buyer could not afford the property.

Mayor Hollingsworth acknowledged resident comments on Magruder Pointe and Sacred Heart that evening. Regarding Magruder Pointe, she said the Council had been deliberate and transparent with the process to be fair to residents and the applicant. She noted the Magruder Pointe would return to the Council for action on May 21.

11) **Council Dialogue (10:35 p.m. – 10:45 p.m.)**

Councilmember Wright said that staff would respond to the public comment regarding the City's Election Code at the next meeting. Councilmember Croslin shared that the Health and Wellness Advisory Committee had hosted a program last month on environmental health concerns, but it was poorly attended. He encouraged residents to support the committee programs. Council Vice President Ward said it was Foster Care Month and encouraged interested individuals to contact him for information on foster care programs. Council President Haba shared Councilmember Solomon's regrets for missing the meeting, stating that he was ill. Councilmember Warner offered warm wishes to young resident, Imogene Kramer, a recent heart transplant recipient and her family.

City Administrator Nicholson expressed appreciation for retiring Police Chief Holland. She welcomed Interim Police Chief Amal Awad.

12) **Community Notices and Meetings**

[Cover Page](#) 

[Main City Calendar_May 8 - May 14 2018.docx](#) 

13) **Motion to Adjourn**

The meeting adjourned at 11:48 p.m.

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



Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Ron Brooks

Submitting Department: Finance

Item Type: Audit

Agenda Section: Presentations (8:20 p.m. - 8:40 p.m.)

SUBJECT

FY17 Audit Update (5 minutes)

HCC-166-FY19

Recommendation:

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

Summary Background:

The FY17 audit is still in the last phase. Auditors have completed work regarding City contracts and are now reviewing other budget appropriations and budget variances. Our goal is to complete the audit analysis process by the end of this calendar year with final report available in January as reported at the November 19th meeting. We are in the holiday period which may slow the closeout period.

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: December 3, 2018

Submitted by: Katie Gerbes

Submitting Department: Community & Economic Development

Item Type: Presentation

Agenda Section: Presentations (8:20 p.m. - 8:40 p.m.)

SUBJECT

Hyattsville Circulator Feasibility Study (15 minutes)

HCC-160-FY19

Recommendation:

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

[CityCouncilPresentation_CirculatorStudy FINAL.pdf](#)

[Transit Circulator Study_Updated Final.pdf](#)

Summary Background:

In May 2018, staff contracted with Toole Design Group to conduct a circulator feasibility study to evaluate routes, service frequency and costs associated with operating a City-wide circulator system. Toole Design Group, analyzed operations of three nearby circulator systems and the existing The Bus Route 13, operated by Prince George's County DPW&T, to determine the headways, destinations and costs associated with a hypothetical circulator system. Toole Design provided a variety of options, ranging from a private or publicly operated system, extended or limited service and one-way or two-way circulation and cost estimates for variable routes. The cost estimates range from \$715,000 to \$4,300,000 annually to operate a circulator bus, depending on the service model and frequency selected.

Next Steps:

The Circulator Feasibility Study and its findings will be on the "Discussion" Agenda on December 17, 2018.

Fiscal Impact:

\$715,000 - \$4,300,000 annually depending on service route and frequency

City Administrator Comments:

Presentation Only

Community Engagement:

In order to gather input on the desired routes, wait times and user fees, a survey was posted on the Speak Up website in June and July 2018. Staff also attended the June and July Summer Jam events to survey those in attendance in order to generate additional responses.

Strategic Goals:

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

Legal Review Required?

N/A

Hyattsville Transit Circulator Feasibility Study



- City Council Presentation – December 3, 2018

Study Purpose

- Evaluate the operational and financial viability of a high-frequency transit circulator in Hyattsville.
- Connect key destinations within Hyattsville:
 - Gateway Arts District
 - West Hyattsville Metro
 - Prince George's Plaza Metro
 - Access to the MARC Riverdale station



Example of a Circulator

Circulator Benefits

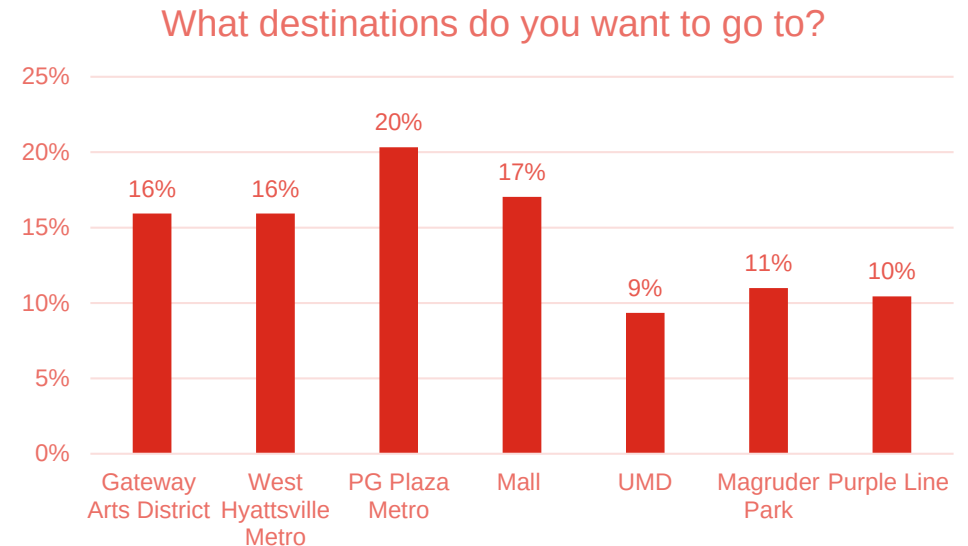
- Enhance economic vitality
- Reduce congestion and pollution
- Contribute to a pedestrian-friendly downtown area
- Facilitate the viability of commuting with transit



Photo source: Elvert Barnes / CC 2.0

Public Survey Results

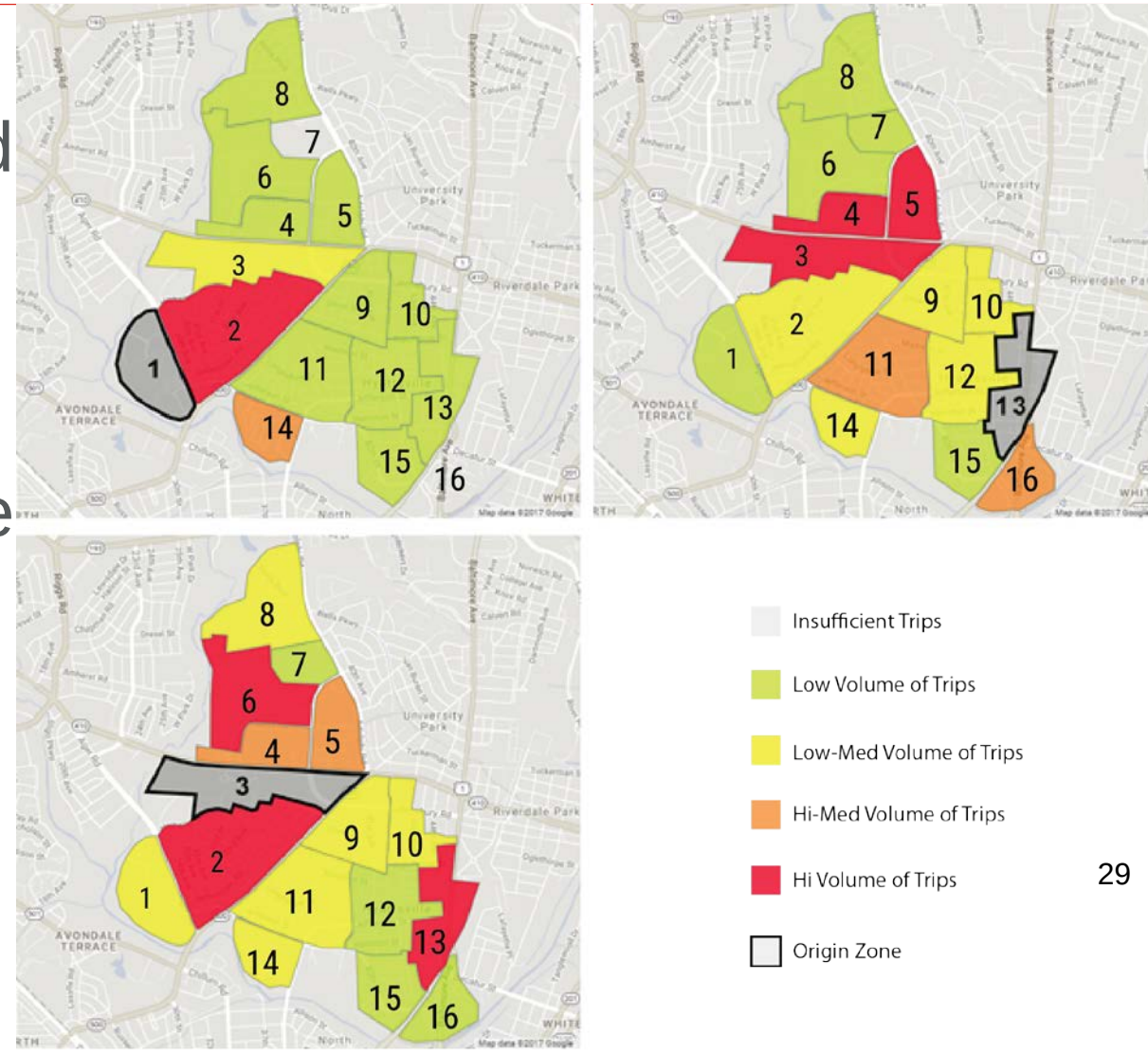
- Posted on City's website and Speak-Up portal: June 16 - July 25, 2018
- 71 responses received.
- Respondents support a circulator that operates
 - Seven days a week
 - Mornings and evenings services
 - A nominal fare



Existing Trip Patterns

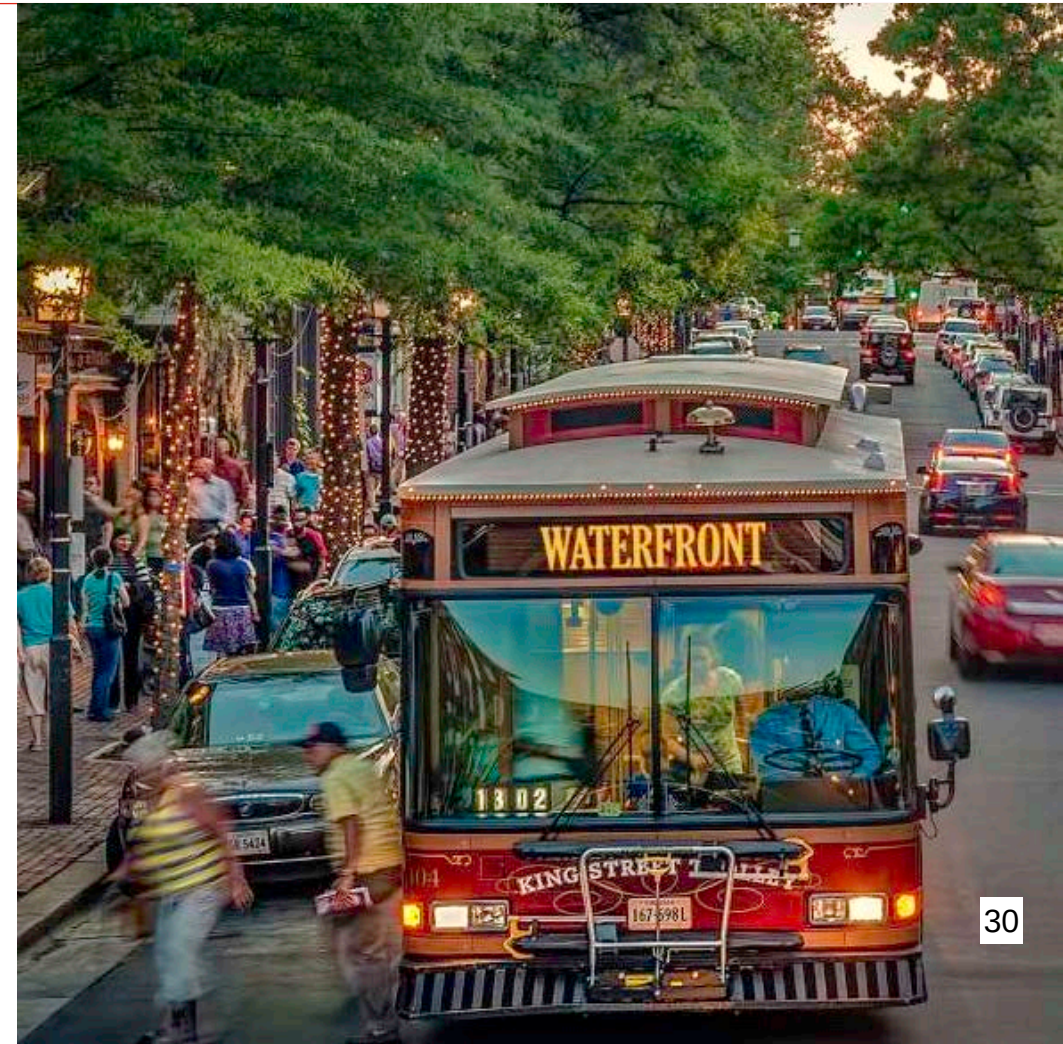
- Big-Data, which utilizes anonymized data from location services on mobile and navigation devices, was analyzed.
- A high demand for trips between the Prince George's Plaza Metro and the Gateway Arts District was demonstrated

Origin Maps



Peer System Review

- Three systems were interviewed:
 - Bethesda Circulator (Bethesda, MD)
 - King Street Trolley (Alexandria, VA)
 - Charm City Circulator (Baltimore, MD)
- TheBus Route 13 was reviewed.



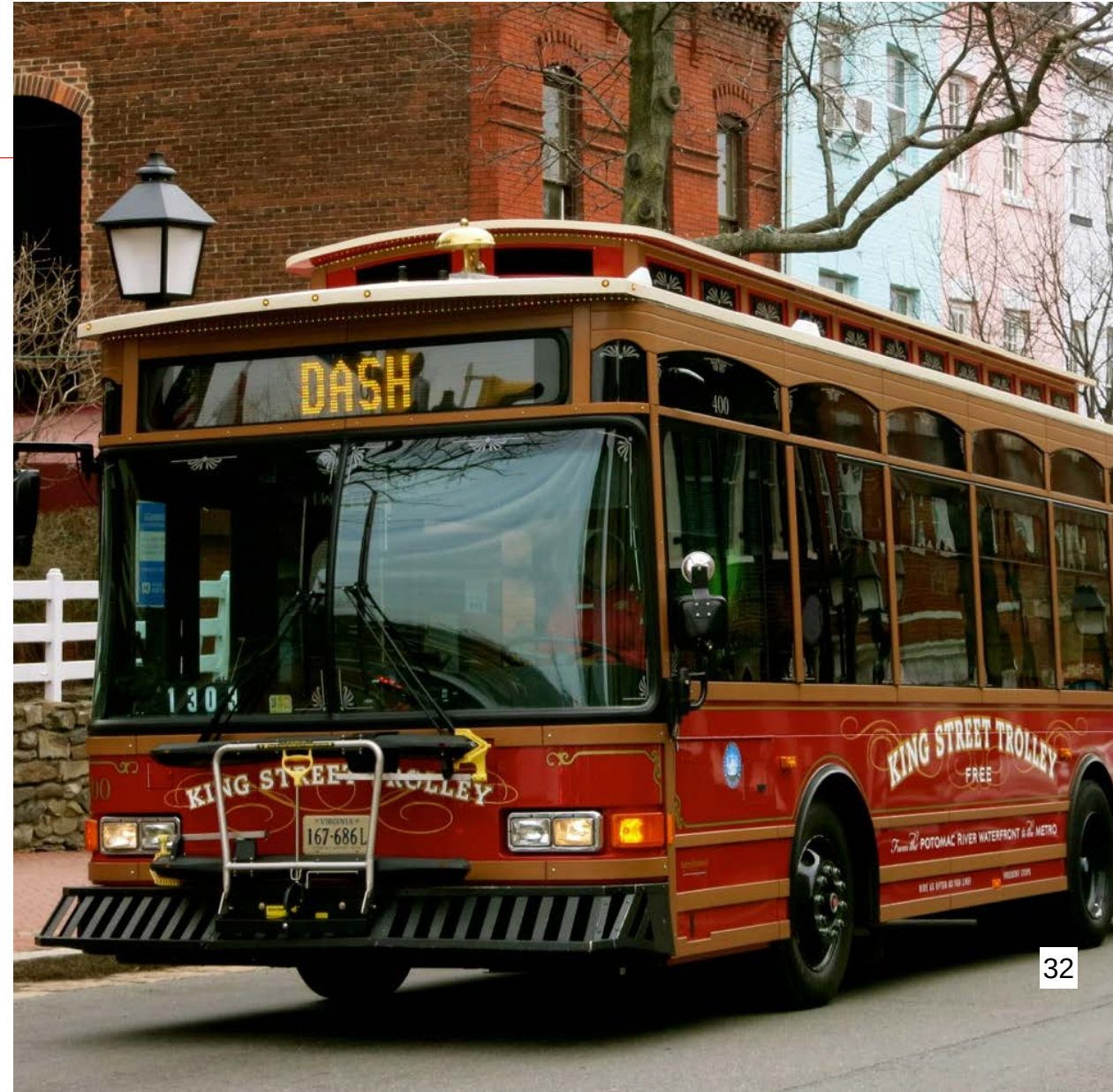
Bethesda Circulator

- One 2.1 mile route with 20 stops
- 3 buses at 10 min headways
- Free service
- Operates all days except Sunday
- 35,000 ridership / month
- Privately operated at approx. \$730,000 per year



King Street Trolley

- One 2.7 mile route with 18 stops
- 6 buses at 10 min headways
- Free service
- Operates all days
- 70,000 ridership / month
- Publicly operated at approx. \$960,000 per year



Charm City Circulator

- Four routes with multiple stops
- 24 buses at 10-15 min headways
- Free service
- Operates all days
- 30,000 – 145,000 ridership / month
- Cost unknown



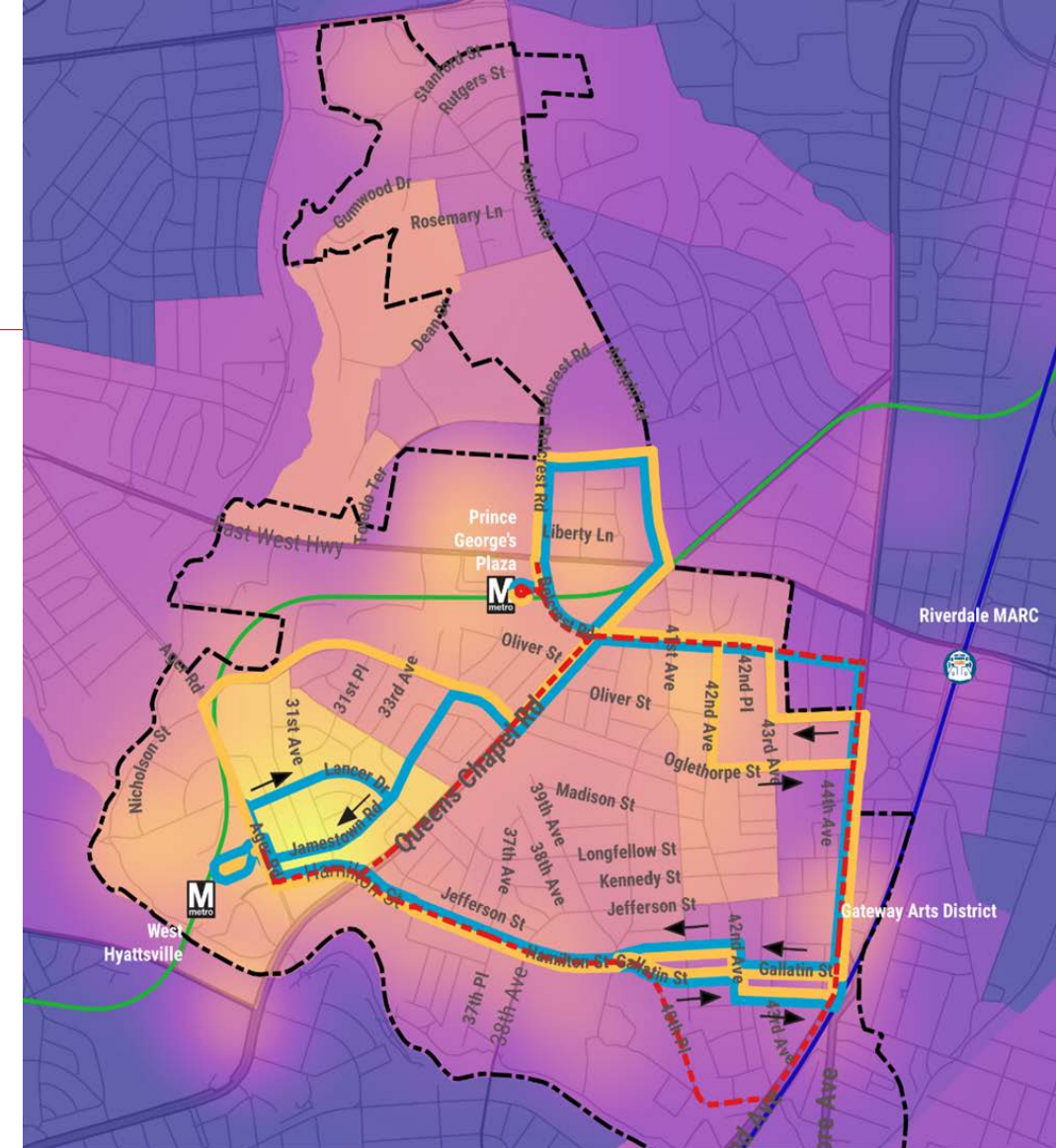
TheBus Route 13

- DPW&T operates Route 13 – connects key Hyattsville destinations
- 40 minutes headway is inconvenient
- Currently costs county approx. \$661,000 annually to operate



Transit Needs Index

- Spatial analysis that factors in:
 - Population, employment density
 - Transit stations, attractions
 - Equity
- Two potential routes were identified
- Major stops were identified



0 1/2 mile



- Route Option 1
- Route Option 2
- Citizen Proposed Route
- MARC Train Camden Line
- WMATA Green Line

Transit Needs Index

- Low Need 35
- Medium Need
- High Need

Ridership Estimates

- The ridership of a future transit circulator is estimated to be between **12,000 and 38,000 riders each month.**

Ridership Estimates

- The ridership of a future transit circulator is estimated to be between **12,000** and 38,000 riders each month.

Based on national research
of Downtown Circulators

Ridership Estimates

- The ridership of a future transit circulator is estimated to be between **12,000** and **38,000** riders each month.

Based on current ridership and demographic characteristics of five comparable circulator characteristics.

Ownership and Operational Models



Municipal
Ownership

Private
Contracting

Transit
Agency
Partnership

Ownership and Operational Models



Municipal
Ownership

Private
Contracting

Transit
Agency
Partnership

Most feasible options

Cost Estimates

- Overall, cost estimates range from \$715,000 to over \$4 million.
- Estimates vary based on:
 - One-way versus two-way circulation
 - Hours of operation
 - Headways
 - Private versus County operation
 - Vehicle type

Cost Estimates: Two- Way Service (recommended)

■ Extended Hours:

- 7:00 am – 11:00 pm (Mon-Thurs)
- 7:00 am – 12:00 am (Fri)
- 10:00 am – 12:00 am (Sat-Sun).

■ Limited Hours:

- 7:00 am – 10:00 pm (Mon-Thurs);
- 7:00 am – 11:00 pm (Fri);
- 10:00 am – 11:00 pm (Sat);
- No service on Sundays.

Hours of Operation	Operator	10 Minute Headways (4 vehicles)	15 Minute Headways (3 vehicles)
Extended	County	\$4,310,240	\$3,330,640
	Private	\$2,420,000 - \$3,300,000	\$1,870,000 - \$2,550,000
Limited	County	\$3,526,560	\$2,546,960
	Private	\$1,980,000 - \$2,700,000	\$1,430,000 - \$1,950,000

Cost Estimates: One- Way Service

■ Extended Hours:

- 7:00 am – 11:00 pm (Mon-Thurs)
- 7:00 am – 12:00 am (Fri)
- 10:00 am – 12:00 am (Sat-Sun).

■ Limited Hours:

- 7:00 am – 10:00 pm (Mon-Thurs);
- 7:00 am – 11:00 pm (Fri);
- 10:00 am – 11:00 pm (Sat);
- No service on Sundays.

Hours of Operation	Operator	10 Minute Headways (4 vehicles)	15 Minute Headways (3 vehicles)
Extended	County	\$2,155,120	\$1,665,320
	Private	\$1,210,000 - \$1,650,000	\$935,000 - \$1,275,000
Limited	County	\$1,736,280	\$1,273,480
	Private	\$990,000 - \$1,350,000	\$715,000 - \$975,000

Funding Sources

- City funding
- State funding
- Advertising Revenue and Naming Rights
- Federal Funding
- Other – partnerships with non-profits or developers, development review process.
- Fares

Funding Sources

- City funding
- State funding
- Advertising Revenue and Naming Rights
- Federal Funding
- Other – partnerships with non-profits or developers, development review process.
- **Fares** – Though fares would offset costs, they would not be a major revenue source, and would make the circulator service less attractive to riders.

Key Operational Recommendations

- Clockface headways every 10-15 minutes
- Two-way circulation
- Hours of operation seven days a week, from early morning until late evening, with late night hours on Friday and Saturday nights
- Free fares
- A strong branding and outreach campaign

Bottom Line

- Transit circulators can bring benefits to downtown areas and facilitate mode-share shifts.
- A circulator could enhance transit connectivity between key destinations.
- **Circulator systems do not cover their own costs, and require subsidies to operate.**

Next Steps

If Hyattsville decides to move forward with the project, the next steps should be:

- Determine the desired operational characteristics
- Identify dedicated funding source in the range of \$715,000 - \$4,300,000 annually
- Pursue partnership with Prince George's County to modify Route 13
- If discussion with the County fails, pursue to hire private contractor to operate the system

Thank you

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HYATTSVILLE TRANSIT CIRCULATOR FEASIBILITY STUDY

December 2018 | FINAL

CONTENTS

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Report Purpose	4
Existing Conditions	4
Routing Plan	16
Business Proforma and Financial analysis	22
Recommendations	26



Example of a Circulator, the Bethesda Circulator

EXECUTIVE SUMMARY

In response to resident demand for a high-quality transit connection from the Gateway Arts District to other key destinations, the Hyattsville City Council commissioned a study to evaluate the feasibility of a local transit circulator. This study assesses the operational and financial viability of a high-frequency circulator service in Hyattsville.

Study Approach

This report considered factors such as public survey results, existing trip patterns, interviews with peer circulator systems in the DC metro area, information from Prince George's County Department of Public Works & Transportation (DPW&T) and private bus circulator operators and a national study of downtown circulators from around the country. Building on these factors and incorporating additional datasets, two routing plans and a ridership projection were developed.

What is a Circulator?

A transit circulator is a localized transit system that provides direct, frequent service between neighborhoods, commercial areas and other activity centers, and even other regional transit hubs (i.e. Metro, MARC) within a community.

What We Learned

Some key takeaways from this Report:

- **Survey Respondent Preferences:**
 - o Respondents support a circulator that operates seven days a week, including mornings and evenings.
 - o Out of 71 respondents, 64 percent would be willing to pay up to \$1.00 per ride.
 - o 73 percent of respondents would be willing to wait up to 15 minutes for the bus.
- **Existing Trip Patterns:** Existing trip patterns were determined using a “Big Data Analysis”, which utilized anonymized data from location services on mobile devices. This analysis demonstrated a high demand for auto trips between the Prince George's Plaza Station and the Gateway Arts District neighborhoods, some of which have the potential to be replaced by transit trips if a convenient and efficient service was available.
- **Peer System Lessons Learned:** Three peer systems were interviewed as part of this study, including the Bethesda Circulator (Bethesda, MD), the King Street Trolley (Alexandria, VA), and the Charm City Circulator (Baltimore, MD). The interviews provided insights into specific operational details of each circulator. Each of the three circulator services operates as fare-free service. Key Statistics:
 - o Headways (bus frequency): 10-15 minutes
 - o Route Distances: 2-5 miles
 - o Monthly Ridership: 30,000 – 146,000 riders
 - o Annual Operating Costs: \$728,551 - \$958,936 (note cost for Charm City Circulator was not available).
- **Estimated Ridership:** The estimated ridership of a future Hyattsville transit circulator would be between 12,000 and 38,000 riders each month.
- **Operational Models:** Of the three operational models available for owning and operating the circulator (municipal ownership, transit agency partnership, and private contracting), the most feasible option is either a partnership with DPW&T (transit agency partnership) or private contracting.

- **Anticipated Costs:** Depending on the operational model and service characteristics, a circulator system operated by DPW&T would cost the City of Hyattsville between \$1,300,000 to \$4,300,00 per year. A circulator system operated by a private contractor would range in cost from \$715,000 to \$3,300,000 per year. The routing of the circulator (one-way versus two-way) and headways are primary drivers between the lowest cost for each option and the highest cost.

Key Recommendations

Based on the public survey results and circulator best practices, any future transit circulator in Hyattsville should adopt following operational characteristics to ensure that the circulator is attractive to potential riders:

- a. Clockface-headways every 10-15 minutes,
- b. Two-way circulation,
- c. Hours of operation seven days a week, from early morning until late evening, with late night hours on Friday and Saturday nights,
- d. Free fares, and
- e. A strong branding and outreach campaign.

Next Steps

If the City decides to move forward with this project, the City of Hyattsville should take the following steps to implement a high-quality transit circulator.

1. Determine the desired operational characteristics (e.g. one-way versus two-way, headways, fares)
2. Identify dedicated long-term funding mechanism in the range of \$715,000 - \$4,300,000 annually to provide quality transit circulator service to residents, employees and visitors alike.
3. Seek partnership with Prince George's County DPW&T to modify their current Route 13 The Bus service to meet the operational goals of the proposed circulator, i.e. new route, hours of service, frequency, etc. Ideally DPW&T would agree to modify the existing route for little to no cost to the City. Alternatively, DPW&T may require a financial partnership with the City in order to achieve the operational goals.
4. If the partnership with Prince George's County is not feasible, Hyattsville should pursue contracting with a private contractor to operate the circulator.

REPORT PURPOSE

This report assesses the operational and financial viability of a high-frequency circulator service that would connect key destinations within Hyattsville: the Gateway Arts District on Route 1, the Washington Metropolitan Area Transit Authority (WMATA) Metrorail stations (Prince George's Plaza and West Hyattsville), and the Maryland Area Regional Commuter (MARC) Riverdale station.

Circulators are typically designed to serve tourists and employees by connecting key destinations along short, closed loops. These localized transit systems can have multiple benefits - Circulators can support economic vitality in urban areas and have the potential to reduce congestion and pollution. Circulators can also contribute to a pedestrian-friendly downtown area. In Hyattsville's case, by providing a reliable transit linkage between the Gateway Arts District and Hyattsville's major transit stations, a circulator could facilitate the viability of commuting with transit in lieu of private automobiles. However, circulators have limited potential for fare box recovery (portion of operational costs paid by riders) and are generally costly to operate with the service characteristics that make them successful (i.e., frequent service, extended operation and low cost to customers).

The Gateway Arts District is an emerging economic, retail, and residential hub that currently lacks a frequent transit connection to Hyattsville's key Metrorail stations. Over the past few years, Hyattsville residents have continued to express support for a circulator service that connects the Gateway Arts District with other parts of the community. A 2017 resident-created online petition received 188 signatures in support of a circulator. That year, in response to persistent resident demand, Councilmember Edouard Haba (Ward 4) submitted a proposal to the Hyattsville City Council to study a potential circulator. Hyattsville's City Council included funding in its Fiscal Year 2018 budget to evaluate the feasibility of a circulator study. This study is the result of that funding.

The *2018 Draft Hyattsville Transportation Study* includes a policy to prioritize connections to and from the Metro stations and the Gateway Arts District. Three related strategies are suggested to implement this policy, including a strategy to conduct a feasibility study to assess the viability of establishing a circulator service between the Metro stations and the Gateway Arts District, connections that existing transit services fail to provide directly and efficiently. This policy was included based on public comment, a "big data analysis", as well as a public survey, all of which provide community support a circulator. The big data analysis revealed that there is significant travel between Prince George's Plaza station, the Gateway Arts District, and West Hyattsville. In addition, a public survey conducted as part of this study received several responses that described the desire for a circulator to better link the Metro stations to the Arts District.

EXISTING CONDITIONS

The Gateway Arts District, the historic heart of the City, has seen tremendous growth in recent years, in part spurred by land use changes and economic development incentives introduced by Prince George's County Planning Board in 2004. The area is now a vibrant hub of arts institutions, retail destinations, residences, and visitor attractions. The district's population increased by 22% from 2011 to 2016.¹ During this same time, median household income increased by 40% and the number of housing units increased by 9%.² The percentage of workers that commute using transit in the district increased by almost 20%, and the average commute time to work increased by four minutes.³ The total share of zero-vehicle housing units decreased from 15.6% to 7.6%.⁴

¹ Comparison of rolling averages for Census Tract 8063 for the 5-year period from 2012-2016 and 2007-2011, from American Communities Survey 5-year estimates.

² *Ibid.*

³ *Ibid.*

⁴ *Ibid.*

These trends show that the growing population in the area has been accompanied by changing commute preferences. While more workers are commuting to and from Washington and Baltimore using transit, a lower percentage of households have zero vehicles. Transit options have not expanded to keep pace with demographic changes or the dynamic, mixed-use nature of the Gateway Arts District. For example, while the existing Prince George's County TheBus Route 13 does connect the Gateway Arts District to Hyattsville's two Metrorail stations, its frequency is limited and the service only operates on weekdays from 6:00 am to 8:00 pm. Residents, workers, visitors, and businesses could benefit from a transit connection that operates on weekends and weeknight evenings.

Existing Transit Service Characteristics

Hyattsville is currently serviced by several transit options. Route maps for each of these agencies are included in Appendix A.

WMATA Metrorail

Hyattsville is serviced by WMATA's Green Line, which connects to downtown Washington D.C., via West Hyattsville and Prince George's Plaza stations. The Green Line operates Monday through Thursday from 5 am to 11:30 pm, Friday from 4 am to 1 am, Saturday from 7 am to 1 am, and Sunday from 8 am to 11 pm. Headways during weekday peak hours are 8 minutes and range from 12 minutes to 20 minutes during off-peak hours. Fares vary based on time of day and distance between stations. As an example, a peak-hour trip from Washington D.C. to the West Hyattsville Metro station would cost \$4.80 using SmarTrip Fare.⁵

Metrobus

Several Local and Major Metrobus routes provide service to Hyattsville. The Major Metrobus route 83 as well as several Local Metrobus routes serve the Gateway Arts District. Headways vary for each route and time of day, ranging from 10 to 60 minutes. Service hours vary by route and day of the week. The fare for regular Metrobus routes is \$2.00 and the fare for express routes is \$4.25.⁶

MARC Train

The MARC Train's Camden Line services Hyattsville's Riverdale Station with access to Washington D.C. (Southbound) and Baltimore (Northbound). Headways range between 25 to 60+ minutes. Service is limited to morning and evening peak hours on weekdays only, with no mid-day service. Fares range based on the destination, but as an example, the fare from Hyattsville's Riverdale Station to Baltimore is \$7.00 and the fare from Riverdale Station to Washington, D.C., is \$5.00.⁷

TheBus

TheBus, operated by Prince George's County's Department of Public Works and Transportation (DPW&T), has five routes that service Hyattsville: 12, 13, 14, 17, and 18. The fare is \$1.25 for adults. Headways vary for each route and time of day, ranging from 30 to 60 minutes.⁸ TheBus Route 13 connects key destinations within Hyattsville that could also be served by any future circulator. Route 13 operates every 40 minutes, with service hours beginning at 6:00 am and ending at 8:00 pm, Monday through Friday.

UMD Shuttle

The University of Maryland (UMD) operates a fleet of over 75 vehicles servicing the University of Maryland Campus and moving over 2.6 million riders a year. The shuttle is designed to serve UMD staff and students but Hyattsville residents are eligible to receive a pass to use the shuttle free of charge. UMD Shuttle 113 services

⁵ Washington Metropolitan Area Transit Authority. <https://www.wmata.com/>

⁶ *Ibid.*

⁷ Maryland Transit Administration. "MARC Train." <https://mta.maryland.gov/marc-train>

⁸ Prince George's County. "Maps & Schedules." <https://www.princegeorgescountymd.gov/1122/Maps-Schedules>

Hyattsville and operates Monday through Friday during the school year with approximately 60-minute headways. The service is offered from 7:00 am to 11:00 pm Monday through Thursday, and from 7:00 am to 9:00 pm on Friday. The route has 34 stops, including the Mall at Prince George's and Prince George's Community College in Hyattsville.⁹ It should be noted that UMD has been consolidating some of its shuttle routes recently.

MDOT MTA Purple Line

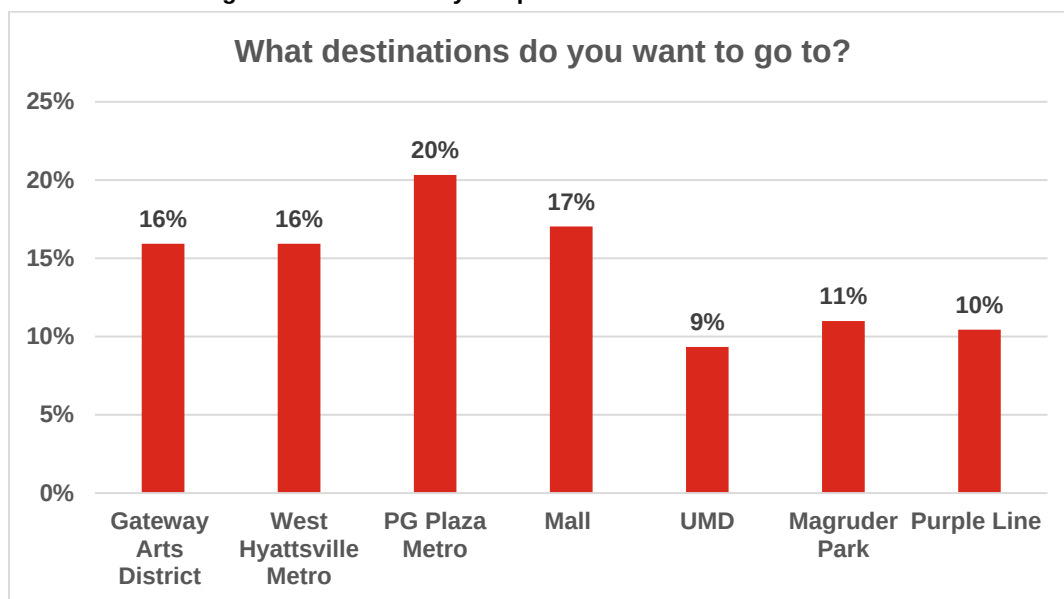
The Maryland Department of Transportation Maryland Transit Administration's (MDOT MTA) Purple Line is currently under construction and is anticipated to be completed by 2022. When completed, the Purple Line will be 16.2 miles long with service from New Carrollton in Prince George's County to Bethesda in Montgomery County. The Purple Line will include four stations servicing the University of Maryland, one of which will provide a direct connection to WMATA's Green Line and MARC's Camden Line.

Public Survey Results

The City of Hyattsville posted a survey about a potential circulator both on their public-facing website as well as on the City's Speak Up portal. **The survey was available from June 16 through July 25, 2018. In total, 71 responses were received.** The survey included questions about how regularly the respondents currently travel using other transit services as well as preferences about service characteristics of the potential circulator. The full survey results can be found in Appendix B but select response results are described below. Generally, survey respondents support a circulator that operates seven days a week, including mornings and evenings, with a nominal fare. Many of the survey respondents currently commute with one or more existing transit services: 53% use Metrorail, 24% use Metrobus, 44% use TheBus, and 19% use the UMD Shuttle.

Figure 1 shows the destinations respondents want to reach by circulator. Prince George's Plaza station, The Mall at Prince George's, West Hyattsville station, and the Gateway Arts District were the top four destinations. Other destinations (outside of Hyattsville) indicated by respondents include Riverdale Park, Cheverly, Bowie, Wisconsin Avenue, Washington Hospital Center, Georgetown Hospital, Kennedy Center, and DC nightlife.

Figure 1. Public Survey Responses – Preferred Destinations



⁹ The University of Maryland. "The Department of Transportation Services." <https://www.transportation.umd.edu/schedules.html>

Figure 2 indicates how long respondents would be willing to wait for a circulator service. **Approximately 76% of respondents are willing to wait up to 15 minutes, which is generally thought of as “frequent” service.** While about a quarter of respondents are willing to wait longer than 15 minutes, infrequent service is generally known to discourage ridership.

Figure 2. Public Survey Responses – Preferred Wait Times

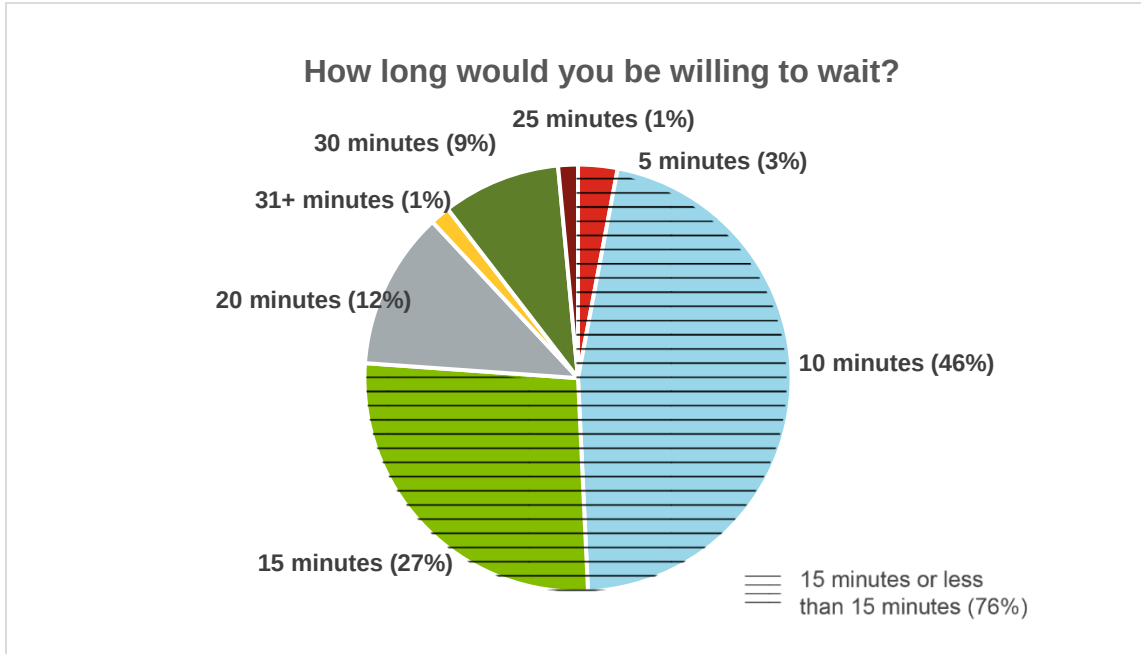
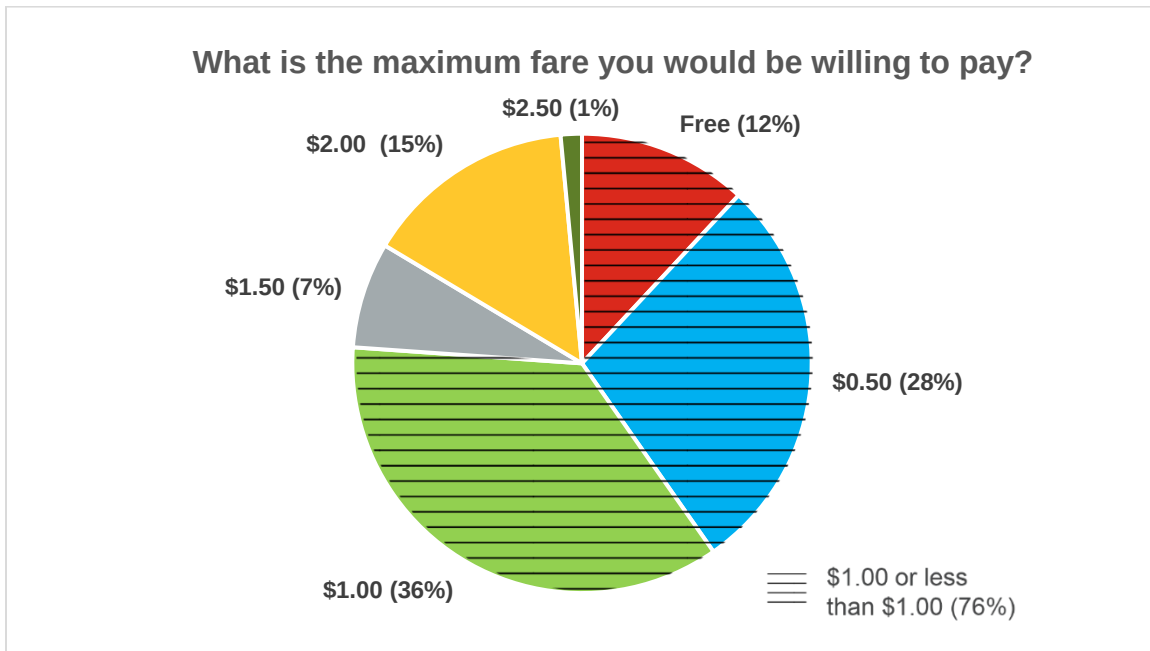


Figure 3 shows the maximum fare respondents would be willing to pay. While 12% of riders are not willing to pay a fare, 28% would be willing to pay \$0.50, with another 36% willing to pay \$1.00. **Approximately 76% of respondents are willing to pay \$1.00 or less.**

Figure 3. Public Survey Responses – Preferred Fares.



When considering the circulator's operational characteristics, the survey results should be referenced. In addition, a target market should be identified and designed for. Any future circulator's target market would likely include residents, employees, and tourists. It is more common for circulators to be geared towards one or two target markets. As such, it will be important to balance the needs of each of these target markets when designing the circulator. For example, Hyattsville today is likely to have more residential and employee demand for a circulator than tourists.

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Big Data Overview

A big data analysis was conducted as part of this feasibility study in order to inform the route and understand the demand for the circulator. The data was provided by StreetLight Data, a company that creates metrics about traffic volume and trips based on archival cellular location data (e.g. cell phones, tablets, etc.). StreetLight Data's sample includes records from over 62 million devices, or about 23% of the adult population, across the US and Canada. StreetLight Data uses anonymized cell-phone location services to provide information on automobile travel patterns. As part of the *2018 Draft Hyattsville Transportation Study*, Hyattsville was divided into 16 zones based on different land uses in order to frame the data analysis. This big data analysis demonstrates significant automobile trip volume between zones that would be serviced by potential future circulator. The West Hyattsville station is located in Zone 1, Prince George's Plaza station is located in Zone 3, and the Gateway Arts District is located in Zone 13. As such, Zones 1, 3, and 13 were the focus of this analysis.

Origin Maps

The following maps show the destinations of trips originating from each of the numbered zones in grey, ranked from high to low. For example, in Figure 4, the first map on the top-left corner shows the trips that originated in Zone 1 and highlights in red the zone which received the most trips from Zone 1. Key highlights from the origin maps, relevant to the zones that would be serviced by the potential circulator, are included below, organized by the relative volume of trips.

Highest Volume of Trips

- Trips originating in Zone 3, ending in Zone 13
- Trips originating in Zone 13, ending in Zone 3

High-Med Volume of Trips

- None (relevant to the potential circulator)

Low-Med Volume of Trips

- Trips originating in Zone 1, ending in Zone 3
- Trips originating in Zone 3, ending in Zone 1

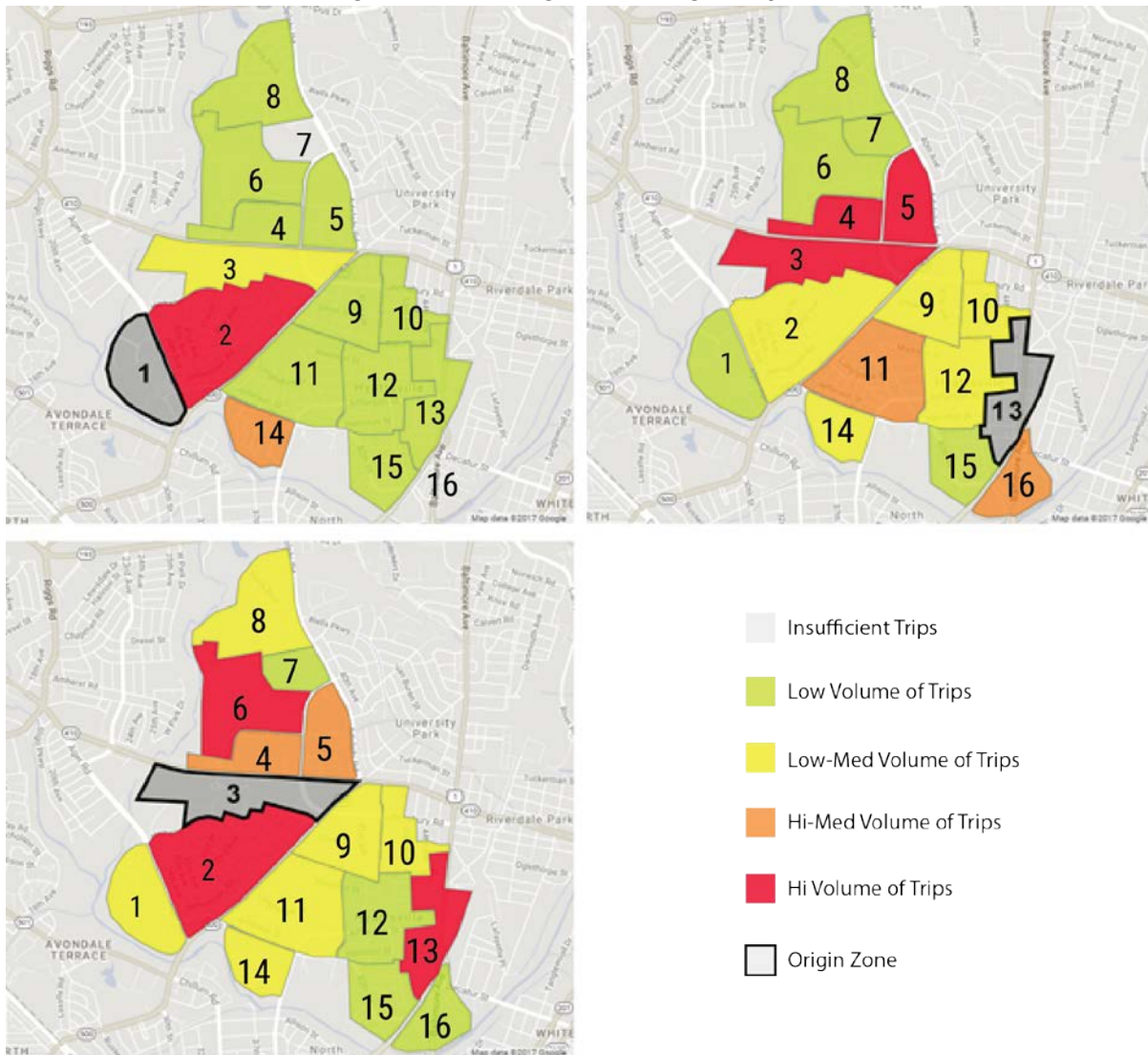
Lowest Volume of Trips

- Trips originating in Zone 1, ending in Zone 13
- Trips originating in Zone 13, ending in Zone 1

Some of these automobile trips could potentially be replaced by transit trips if a frequent, reliable, and convenient option were available. For a detailed breakdown of the origin rate in percent for each zone, refer to Appendix C.

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Figure 4 – Streetlight Data Origin Maps



Destination Maps

The following maps show the origins of trips that reach each of the numbered zones, ranked from high to low. For example, the top-left map of Figure 5 shows the trips that end in Zone 1 and highlights in red, the zones with the highest origin rate of trips ending in Zone 1. Key highlights from the origin maps, relevant to the zones that would be serviced by the potential circulator, are included below, organized by the relative volume of trips.

Highest Volume of Trips

- Trips ending in Zone 13, originating in Zone 3.

High-Med Volume of Trips

- Trips ending in Zone 1, originating in Zone 3.
- Trips ending in Zone 3, originating in Zone 13.

Low-Med Volume of Trips

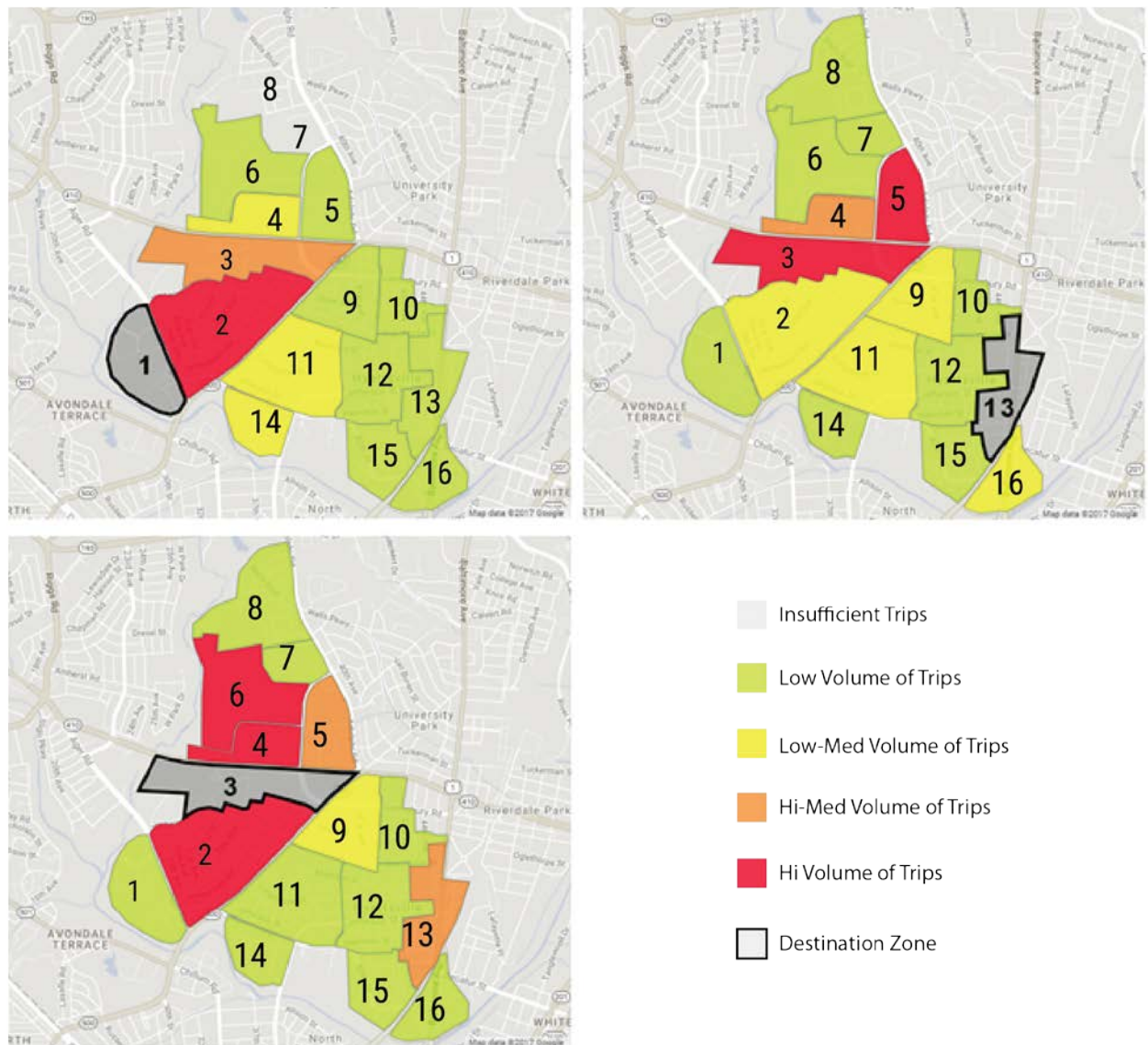
- None (relevant to the potential circulator)

Lowest Volume of Trips

- Trips ending in Zone 3, originating in Zone 1.
- Trips ending in Zone 13, originating in Zone 1.

Similar to the origin maps, the destination maps demonstrate significant automobile trip volume between the zones that would be serviced by future circulator, that have the potential to be replaced if a convenient transit option were available.

Figure 5 – Streetlight Data Destination Maps



A review of the origin and destination traffic patterns between the zones that would be serviced by the transit circulator indicates that there is a moderate demand for travel between the West Hyattsville station and Prince George's Plaza station, and a fairly high demand for travel between the Gateway Arts District and Prince George's Plaza. There is some demand for travel between the Gateway Arts District and the West Hyattsville station, though not as significant as demand between other key destinations. Because these areas are less than 1.5 miles apart, there is the potential for a portion of these trips to be replaced by transit trips if a convenient and efficient service was available, as long as funding is available to provide such a service.

Peer System Review

As part of the research for this report, interviews were conducted with three comparable cities that have existing circulators. The information collected on these peer systems provided an understanding of typical system characteristics including operating hours, service frequency, ridership, fares, financial and ownership models, as well as the successes and challenges faced by each community. The peer communities studied include Bethesda, MD, Baltimore, MD, and Alexandria, VA. **Each of these circulator services are operated as fare-free (no cost) services, with headways ranging from 10 to 15 minutes.** Two of the three circulators studied contract the ownership and operation of the circulator service to private operators, while one circulator is publicly owned. While some elements of these communities are comparable to Hyattsville, none are identical to the City. Each circulator system is designed to fulfill a unique purpose and will therefore have special circumstances meriting diverse design or service characteristics. Profiles of each community are included below.

Bethesda Circulator Profile

Overview

- Number of Routes: 1
- Number of Buses: 3
- Number of Stops: 20
- Service Length: 2.1 miles
- Operating Hours: 7:00 am – 11:00 pm (Mon-Thurs); 7:00 am – 12:00 am (Fri); 10:00 am – 12:00 am (Sat)
- Headways: 10 minutes
- Fares: Free
- Monthly Ridership: 35,000

Ownership Model

- Ownership Model: The Bethesda Urban Partnership oversees the Bethesda Circulator and has contracted out the ownership, maintenance, and operation of the service to private operators.
- Financing Model: Contractor is paid an hourly rate (\$73.74) for 9,880 hours annually with a maximum annual amount of \$728,551. The existing contract runs from July 1, 2014 through June 30, 2020.
- Funding Source: County Mass Transit Dollars
- Capital Costs (to Bethesda/Montgomery County): None. Capital costs are incurred by contractor.
- Operating Costs (to Bethesda/Montgomery County): None. Operating costs are incurred by contractor.

Successes and Challenges

- Contractor Recommendations: The Bethesda Urban Partnership has had success hiring a local transportation company (RMA Worldwide Chauffeured Transportation Services) to operate the service as it provides high level of maintenance, customer service, and driver excellence.
- Vehicle Recommendations: The Bethesda Circulator previously operated with trolleys which did not withstand the harsh conditions of the service. Low floor transit buses are recommended over specialty vehicles like trolleys.
- Short Headways: Headways must remain between 10-15 minutes for the service to remain attractive.

King Street Trolley (Alexandria, VA) Profile

Overview

- Number of Routes: 1
- Number of Buses: 6
- Number of Stops: 18
- Service length: 2.7 miles
- Operating Hours: 11:00 am – 10:30 pm (Sun-Wed); 10:30 am – 12:00 am (Thurs-Sat)
- Headways: 10 minutes
- Fares: Free
- Monthly Ridership:
 - o 2016 Average – 74,119
 - o 2017 Average – 75,615
 - o 2018 (Jan – July) Average – 69,345

Ownership Model

- Ownership Model: Public. The King Street Trolley is run by the Alexandria Transit Company (ATC), a City-owned and independently run non-profit public service corporation which has an independent board of directors including City residents and employees nominated by the Alexandria City Council. ATC also runs the city's DASH bus system and stores and operates the King Street Trolley as if it were an extension of the DASH system. ATC also handles the procurement of the trolleys.
- Funding Source: General Lodging Tax (\$1 per room per night) and general fund
 - o FY 17 (Actual): \$756,583
 - o FY 18: \$952,938
 - o FY 19: \$958,936
- Capital Costs: The City of Alexandria covers capital costs through the CIP and owns the trolleys.
- Operating Costs: The City of Alexandria covers most operating costs.

Successes and Challenges

- Trolley Origins: The Trolley was originally envisioned to encourage tourism and prevent a loss of tourism to the newly developed National Harbor. The trolley connects the King Street Metro with the King Street Corridor, Old Town Alexandria, and a Potomac Water Taxi station. The water taxi connects Alexandria and National Harbor and was originally promoted as a "Free River-to-Rail Service."
- Service Provider Issues: From 2008 – 2012, the King Street Trolley was operated through a City-awarded contract with Martz Gold Line who owned the trolleys. The ridership on the route was lower than expected due to less than advertised service headways. When this contract ended, the City switched to the current model. As a result of this switch, ridership increased by 50% and service headways were reduced from 15 minutes to 10 minutes.
- Budget Cuts and Service Cuts: The budget for ATC and the King Street Trolley have been reduced in recent years resulting in service cuts. The service originally began at 10:00 am on weekdays, was changed to 10:30 am (July 2017), and now operates beginning at 11:00 am.
- Vehicle Recommendations: ATC recommends low floor vehicles with two doors on all vehicles. The current low floor trolleys helped to improve the service over the originally trolleys and two doors would help to reduce the amount of time spent loading and unloading.

Charm City Circulator (Baltimore, MD) Profile

Overview

- Number of Routes: 4
- Number of Buses: 24
- Operating Hours: 7:00 am – 8:00 pm (Mon-Thurs); 7:00 am – 12:00 am (Fri); 9:00 am – 12:00 am (Sat); 9:00 am – 8:00 pm (Sun)
- Headways: 10-15 minutes
- Fares: Free
- Monthly Ridership (June 2014):
 - o Orange Route – 109,447
 - o Purple Route – 146,695
 - o Green Route – 55,864
 - o Banner Route – 28,305¹⁰

Ownership Model

- Ownership Model: City of Baltimore Department of Transportation Transit Bureau oversees the Charm City Circulator and has contracted out the ownership, maintenance, and operation of the service to Transdev. Note that the City has recently awarded a contract to RMA Worldwide Chauffeured Transportation Services (operator of Bethesda Circulator) following a contract dispute with the previous vendor.
- Financing Model: The contractor is paid an hourly rate and has a seven-year contract (5+1+1). The new RFP anticipates 97,000 revenue hours per year.
- Funding Source: City Parking Tax; General Funds; FTA Funds
- Capital Costs: None (for the City). Capital costs are incurred by contractor. The new RFP includes an option for the operator to use 12 City of Baltimore buses as part of the plan.
- Operating Costs: None (for the City). Operating costs are incurred by contractor.

Successes and Challenges

- Operate on Headways, Not Schedule: Instead of setting a schedule and trying to stick to it, maintain headways of 10 minutes or less. This way people can expect the service to come quickly.
- Increase Term, Decrease Price: Increasing the term of the contract reduces risk for the contractor and thus reduces the overall costs for the City of Baltimore.
- Federal Purchasing Requirements: Federal requirements for the purchase of buses using FTA funds can be quite burdensome. If the contractor is required to own, operate, and maintain the buses then this requirement can be avoided.
- Revenue Hours and Scope Creep: Be sure to clearly define what a revenue hour is otherwise invoicing may include other non-revenue hours. Clearly define what the operator is responsible for and can bill for to avoid scope creep.
- Dedicated Funding Source: It is recommended that a dedicated funding source be identified to reduce uncertainty about the services future.

The experience of transit circulator operation in these communities can inform operational decisions for any future Hyattsville circulator. These profiles also informed the ridership estimates included in this report.

¹⁰ Charm City Circulator. "Month of June 2014 Ridership Stats." <https://www.charmcitycirculator.com/news/2014/jul/month-june-2014-ridership-stats>

Takeaways from Transit Cooperative Research Program's Synthesis of Downtown Circulators

Transit Cooperative Research Program's 2011 publication, *Practices in the Development and Deployment of Downtown Circulators* ("TCRP Study"), synthesizes the state of practice of downtown circulators across the country. As part of this study, 78 agencies across the United States completed surveys about the successes, benefits and drawbacks, desired changes, and lessons learned from operating downtown circulators. Of the respondents, most were transit agencies, with only three city departments of transportation responsible for the circulator's operation, and one association affiliated with a business improvement district. The major findings of the study are summarized below:

- The importance of a stable funding source. Operating funding was a major constraint faced by many survey respondents.
- Branding as a key tool to establish identity, especially if tourists and visitors are a target market.
- Simple routes, frequent service, no fares, and clockface headways are most attractive to riders.
- The most common target markets are employees and tourists.
- Partnerships are critical to build political support.
- Size impacts ridership. Of 13 agencies with service area populations below 500,000, only two reported a daily ridership as high as 1,000. Both of these circulators cater to tourists (one is a ski resort operating only during the winter).
- Circulators will not bring visitors to a downtown area that is already struggling.
- Flexibility is key, and many circulator routes have changed over time to adapt to changes in the downtown area.
- Maintenance costs and other issues are often overlooked when selecting vehicles.
- Circulators geared towards tourists had the highest median ridership.¹¹

The study also included a literature review which included a summary of conclusions reach in a 2005 study by Perk et. al. A few of these conclusions are summarized below:

- Successful circulators are associated with frequency, reliability, good connections with other transit modes, and relatively high population and/or employment density.
- Simple routing and ample signage are important for the typical circulator rider who is often unfamiliar with transit.
- Free or low fares encourage ridership.
- Circulator identity is important, and each circulator should be designed to meet the purpose it is serving. For example, downtown employees are not interested in touring local attractions.¹²

Many of these takeaways are germane to any future circulator in Hyattsville and should be strongly considered as planning continues. In particular, the importance of stable funding, the power of branding and partnerships, and the importance of operational characteristics that are attractive to riders should be considered. Proper system development can ensure that the circulator meets the needs of its target market and remains well-used over time.

¹¹ National Academies of Sciences, Engineering, and Medicine. 2011. *Practices in the Development and Deployment of Downtown Circulators*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/14499>.

¹² Perk, V., M. Catalla, J. Volinski, J. Flynn, and M. Chavarriaet, *Strategies for an Intra-Urban Circulator System*, Florida Department of Transportation/National Center for Transit Research, Tallahassee, Nov. 2005.

ROUTING PLAN

Routing and Operation Plan

In order to identify a route that would service areas of Hyattsville that need it most, a Transit Needs Index was created. This analysis identified the activity centers, other destinations, and demographic factors that would be conducive to circulator service. The Transit Needs Index was developed using demographic, transit, and attractions data, which were weighted according to the factors shown in Table 1 and combined. The resulting Transit Needs Index is shown in Figure 6.

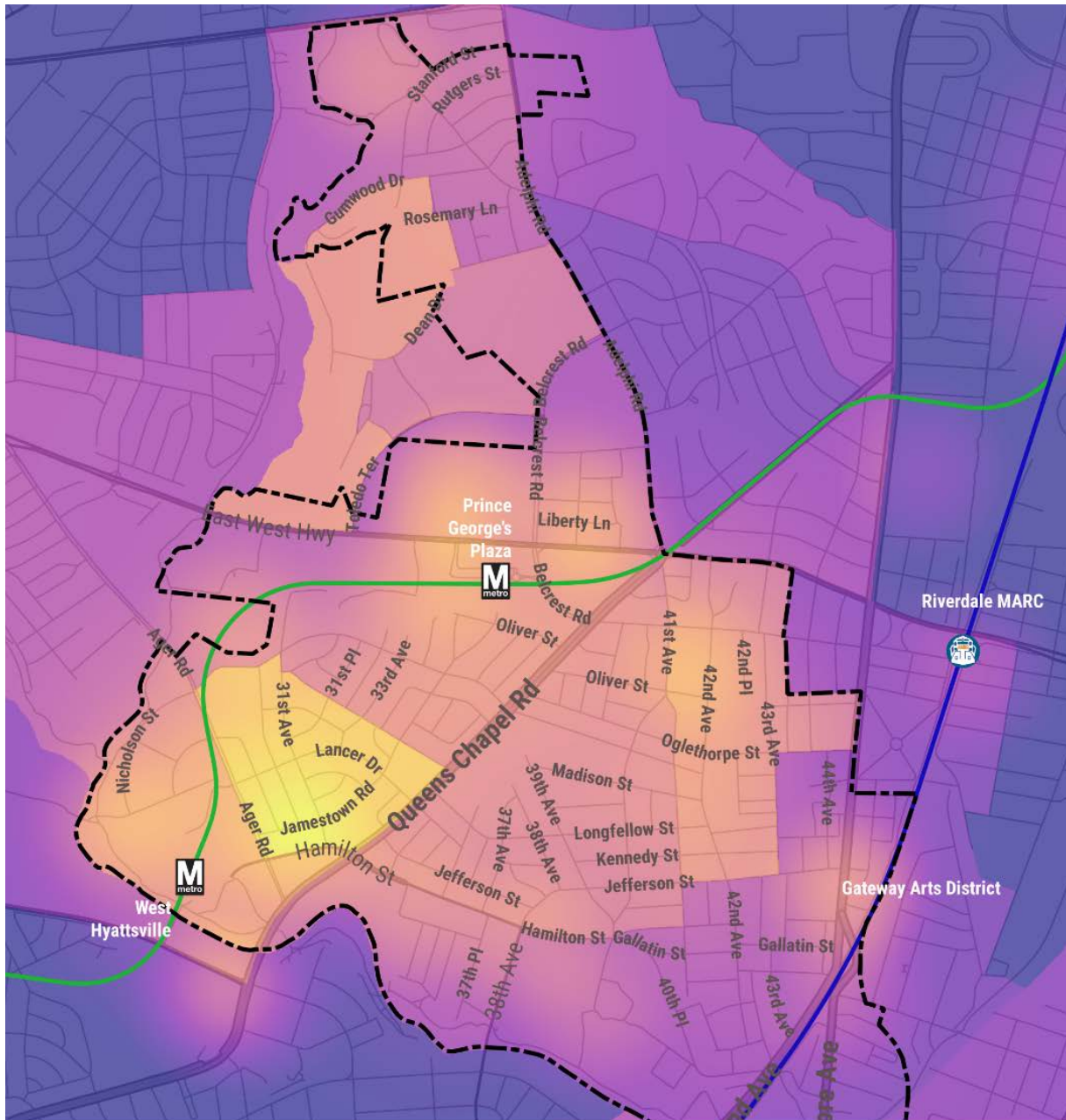
Table 1 – Transit Needs Index Inputs

Input	Data Source	Distance (Miles)/ Geography	Factor
Population Density	2016 American Communities Survey	Census Block Group	20%
Employment Density	2015 LEHD Workplace Area Characteristics	0.5	20%
Transit	-	-	25%
Metrorail Station Proximity	Map data	0.5	
Transit Mode Share	2016 American Communities Survey	Census Block Group	
Attractions	Local knowledge	0.25	25%
Equity	-	-	10%
Low-Income Households	2016 American Communities Survey	Census Tract	
Zero-Car Households	2016 American Communities Survey	Census Tract	
Total			100%

Based on the route proposed by Hyattsville residents (shown as the dashed red line in Figure 7), conversations with the City, the Transit Needs Index, and local knowledge, two potential circulator route options were considered. Both the route options are anticipated to provide a two-way service due to the large service area that the routes have to cover. As opposed to one-way service, which entails circulation along a loop in one direction, two-way service offers circulation in both directions at the same time. The downside of one-way service is that the trips to- and from- a traveler's origin and destination are likely to have different lengths, with one trip significantly longer than the other. For example, if someone was travelling from the southern portion of the Gateway Arts District to the northern portion of the district and back, one of these trips would be fairly direct, while the other would be very lengthy and indirect. Due to this inconvenience of one-way service, a two-way service is recommended.

Overall, the two potential routes considered in this report better reflect the needs identified in the Transit Needs Index than the original route proposed by citizens. Both routes differ from the route proposed by Hyattsville residents in that they include an additional circuit continuing on Belcrest Road, Toledo Road, and Adelphi Road to capture the demand in the Mall at Prince George's that was highlighted in the Transit Needs Index. Both routes have also been changed to travel from the Gateway Arts District to the West Hyattsville Metrorail station via Gallatin Street and Hamilton Street (Farragut Street and Gallatin Street for counter clockwise travel) instead of 40th Place. This would allow closer access to City Hall and Prince George's County Court Building, which are key destinations. In addition, both routes have been updated to travel through the Queens Chapel Manor neighborhood to varying degrees. Access to Queens Chapel Manor neighborhood is important because of its high rank on the Transit Needs Index due to its relatively high population density. Option 1 (shown as the blue line in Figure 7) is directed on Lancer Drive and Jamestown Road (Jamestown Road and Nicholson Street for counter clockwise travel). Option 2 (shown as the yellow line in Figure 7) fully circumnavigates the neighborhood on Ager Road and Nicholson Road, which provides access to additional high-density areas and destinations including Heurich Park, Edward M. Felegy Elementary and Nicholas Orem Middle School.

Figure 6 – Transit Needs Index



0

1 / 2 mile



Transit Needs Index

Low Need

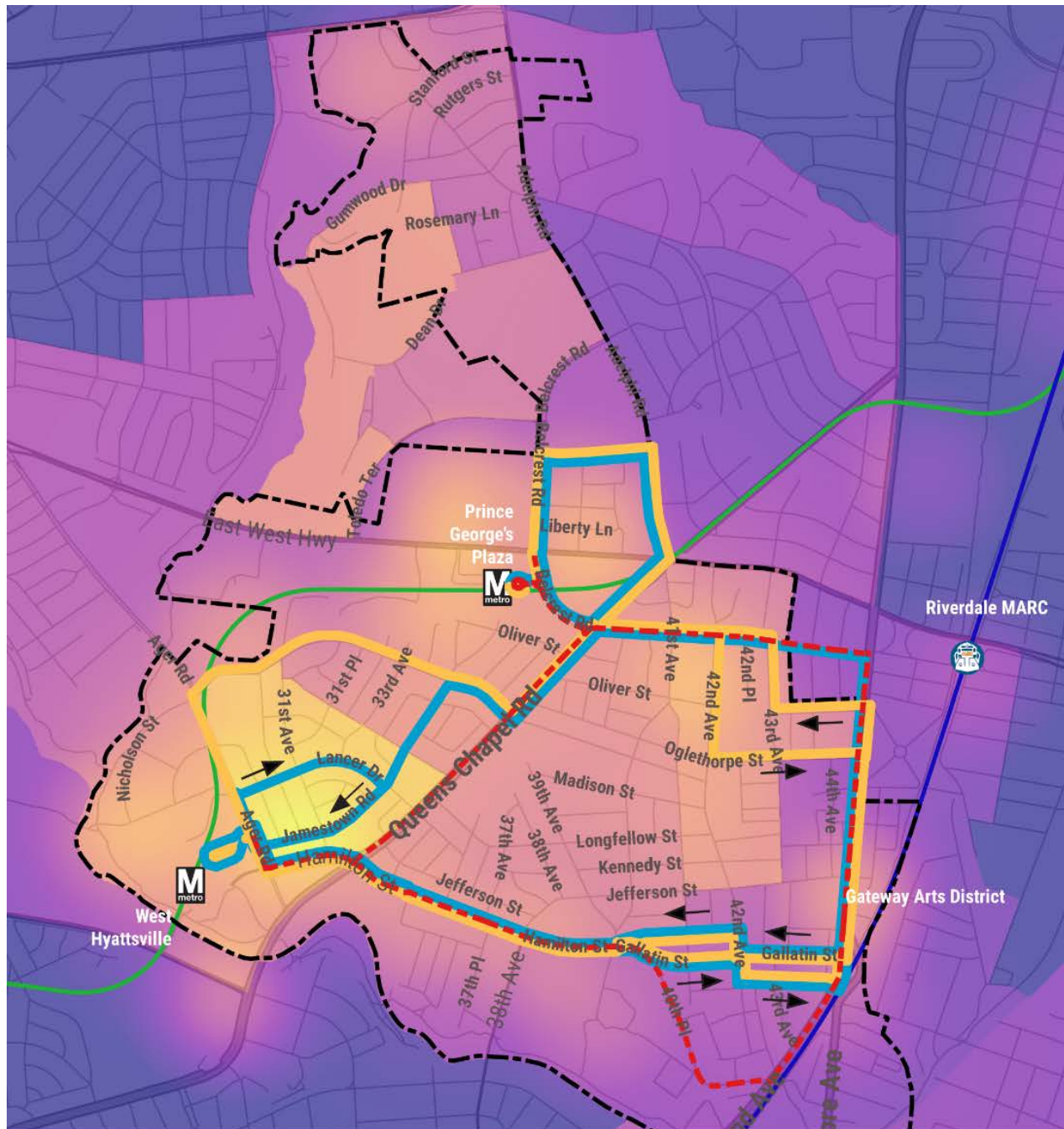
Medium Need

High Need

MARC Train Camden Line

WMATA Green Line

Figure 7 – Potential Route Options



0 1 / 2 mile



- Route Option 1
- Route Option 2
- Citizen Proposed Route
- MARC Train Camden Line
- WMATA Green Line

Transit Needs Index

- Low Need
- Medium Need
- High Need

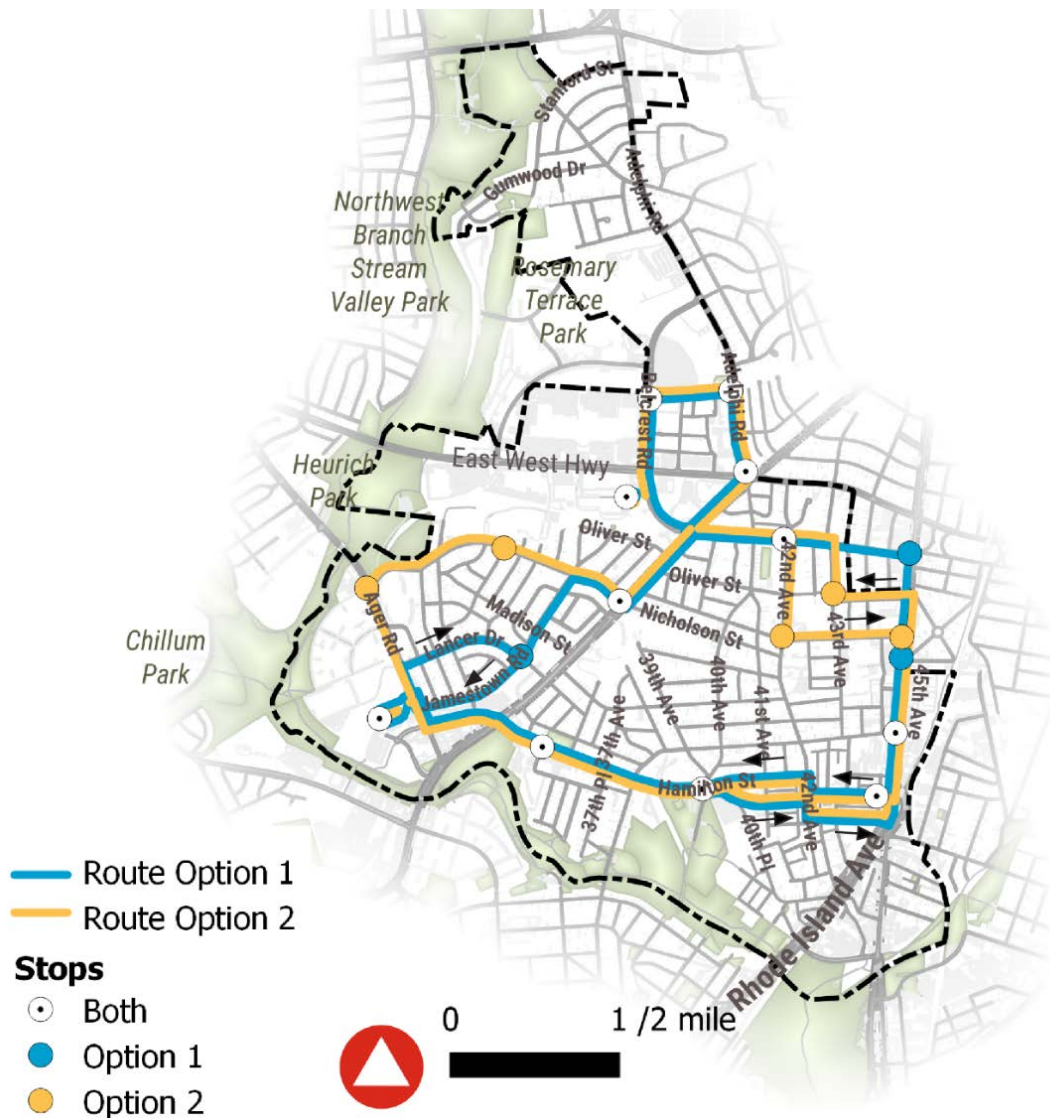
Route Option 2 also differs from Route Option 1 in that it diverts from Queensbury south onto 42nd Street, connecting to Baltimore Avenue on Oglethorpe Street. While this option allows better access to the area near Hyattsville Middle School, which ranks highly on the Transit Needs Index due to attractions and employment density, this provides less direct access to the Riverdale MARC station. Instead of the 0.25-mile walk to the MARC station offered by Option 1, Option 2 would require a 0.5-mile walk to the station. The City will need to determine which of these routing tradeoffs is preferable.

Recommended major stops are shown in Table 2 and Figure 8. The major stops were also informed by the Transit Needs Index. Additional stops may be added based on community input and other key destinations. Unless servicing a key destination or addressing a particular need, any additional stops should be spaced at least ¼ mile apart. This distance ensures that stops are within a reasonable walking distance from each other along the route.

Table 2 – Potential Major Stops

Stop Location	Justification	Route
Baltimore Ave and Jefferson St	Gateway Arts District	Option 1 and 2
Gallatin St and Church Pl	City Hall and Prince George's District Court	Option 1 and 2
Hamilton St and 39th Ave	Magruder Park	Option 1 and 2
Hamilton St and 35th Pl	Hyatt Park and Police Department Headquarters	Option 1 and 2
West Hyattsville Station	Metrorail connection	Option 1 and 2
Jamestown Rd and Lancer Dr	Residential density	Option 1
Queens Chapel Rd and Nicholson St	Major street connection	Option 1 and 2
Prince George's Plaza Station	Metrorail connection	Option 1 and 2
Belcrest Rd and Toledo Rd	The Mall at Prince George's	Option 1 and 2
Belcrest Rd and Adelphi Rd	Prince George's Plaza Community Center and other destinations	Option 1 and 2
Adelphi Rd and East West Hwy	University Town Center and other destinations	Option 1 and 2
Queensbury Rd and 42nd Ave	High employment and population density, destinations	Option 1 and 2
Queensbury Rd and Baltimore Ave	Transit connection	Option 1
Baltimore Ave and Madison St	Gateway Arts District	Option 1
42nd Ave and Oglethorpe Ave	High employment and population density, destinations	Option 2 (Clockwise)
43rd Ave and Oliver St	High employment and population density, destinations	Option 2 (Counter Clockwise)
Oglethorpe St and Baltimore Ave	Gateway Arts District, DeMatha Catholic High School	Option 2
Ager Rd and Nicholson St	Heurick Park, high population density	Option 2
Nicholson St and 31st Pl	Edward M. Felegy Elementary and Nicholas Orem Middle Schoc	Option 2

Figure 8 – Potential Bus Stops



Ridership Scenarios

It is estimated that the ridership for a future transit circulator would be between 12,000 and 38,000 riders each month. The low-end of this estimate is based on the median ridership of circulators operating in cities with service area populations under 500,000, provided in the TCRP Study. The high-end of this estimate is based on current ridership and demographic characteristics of five comparable circulator services, including Bethesda's circulator, Alexandria's King Street Trolley, and three routes of Baltimore's Charm City Trolley.

For each circulator, the population density and employment density within one-quarter mile of each route was plotted against ridership. A trendline was fitted to these results, as shown in Figures 9 and 10, and Hyattsville's population density and employment density within $\frac{1}{4}$ mile of the potential route (Option 1) were used to create two ridership estimates—one based off of population density and one based off of employment density. The higher of these two estimates is included here as the high-end estimate. These are estimates only, and actual ridership will vary seasonally and based on the service characteristics of the circulator as well as branding and outreach efforts.

Figure 9 – Employment Density Ridership Trendline Estimate

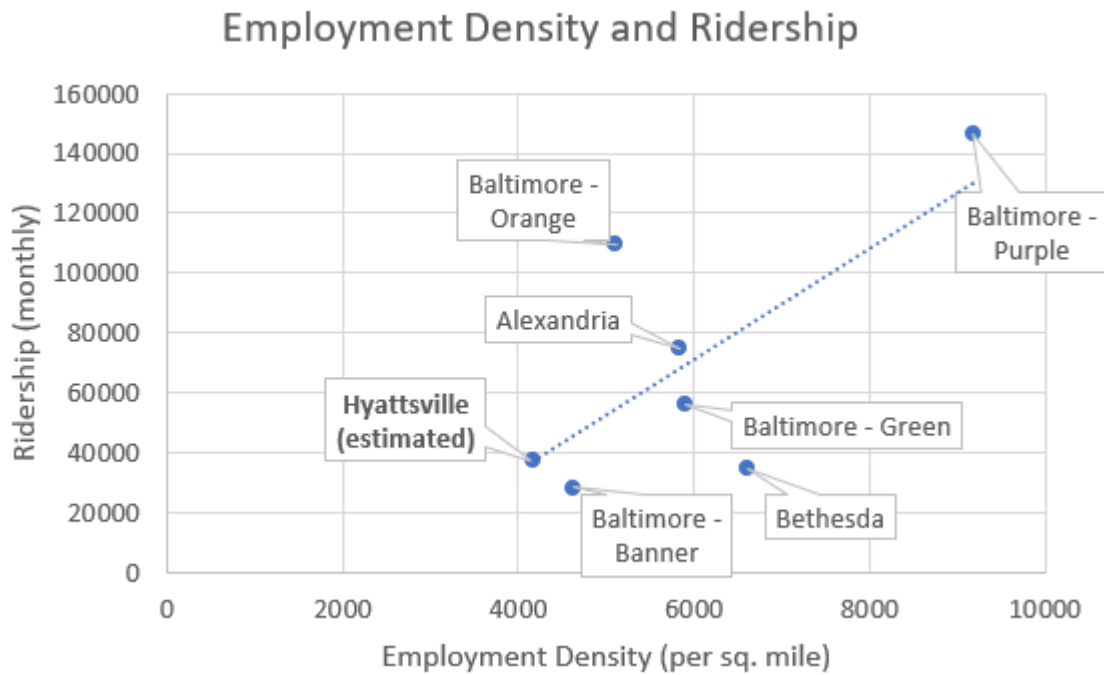
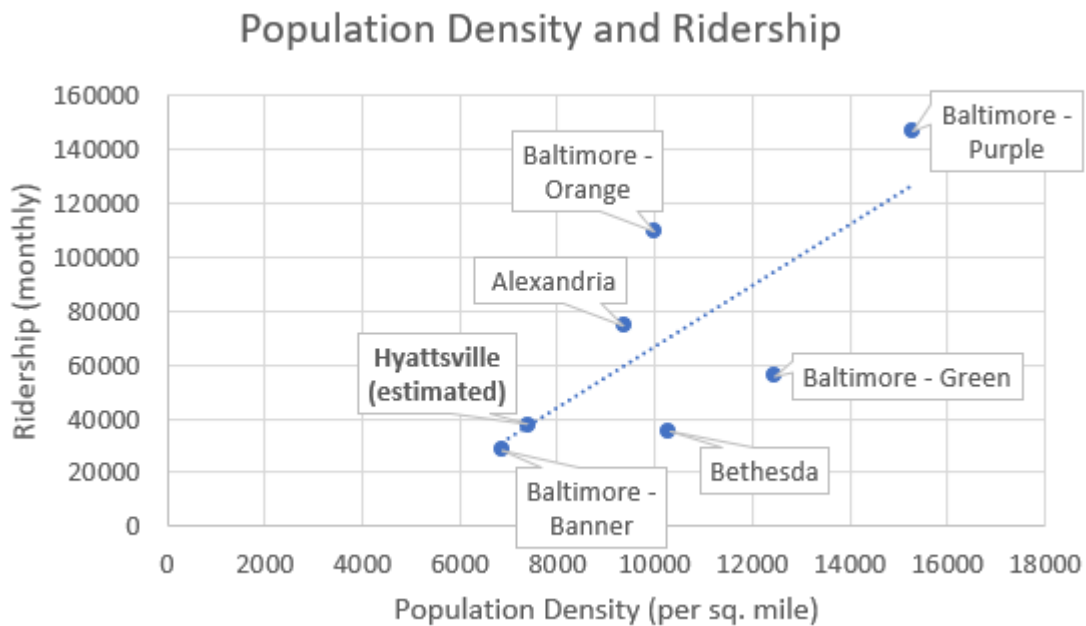


Figure 10 – Population Density Ridership Trendline Estimate



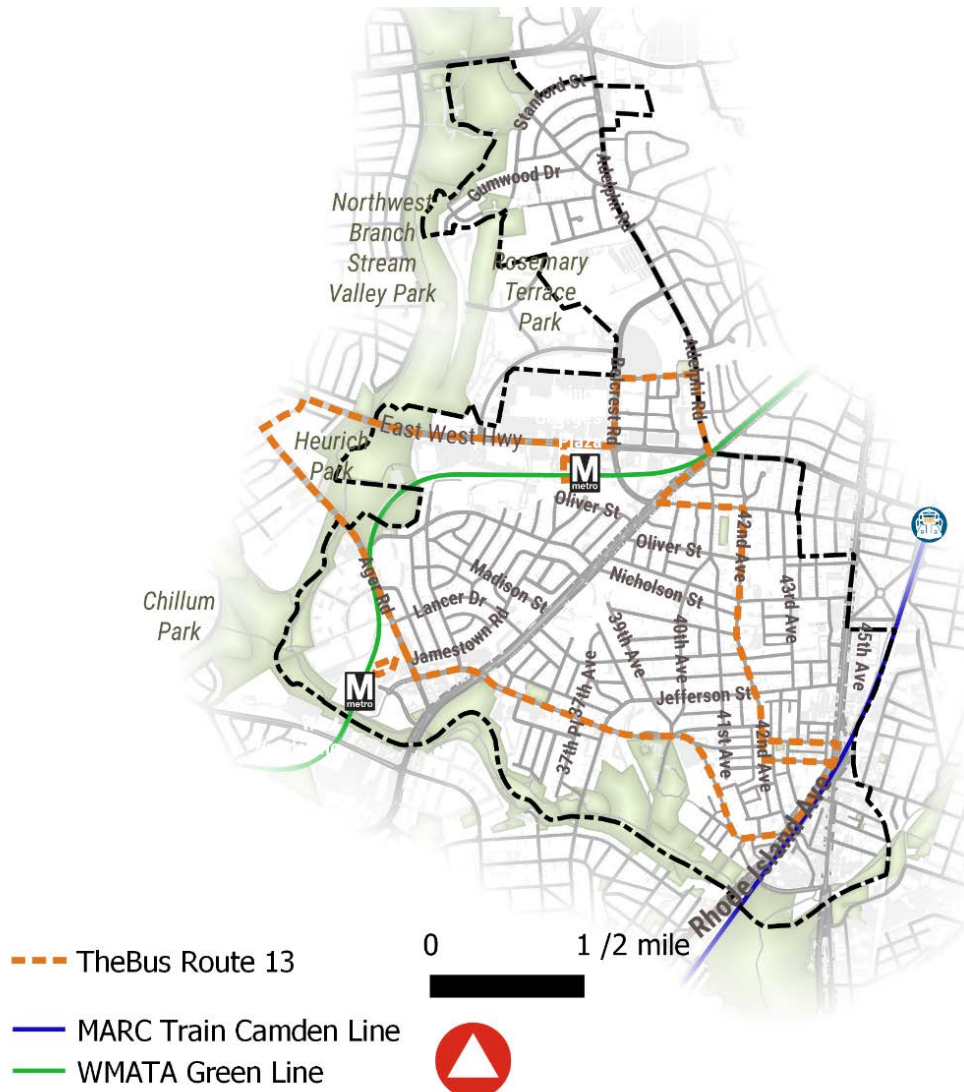
BUSINESS PROFORMA AND FINANCIAL ANALYSIS

Operational Models

There are three models available for owning and operating the circulator: municipal ownership, transit agency partnership, and private contracting. The municipal model would entail the City of Hyattsville owning and operating the circulator. Generally, cities without a history of operating a transit system do not choose this option. Because the City does not currently own, operate, or oversee transit services, this model is not recommended due to the sizeable costs and the complexity associated with setting up the infrastructure that would be required to operate a transit system.

A second option is to partner with Prince George's County DPW&T and form a partnership to improve the existing TheBus Route 13 to match the needs of the City. The existing route that Route 13 takes is included below (Figure 11).

Figure 11 – TheBus Route 13 Map



With contribution of City funds, this route could potentially be expanded to become a more viable transit connection for the Gateway Arts District. Transformation of this two-way route into a convenient transit connection would entail reducing headways from the current 40 minutes to no more than 15 minutes and adding weekend service. In addition, to meet the goals of the future circulator, the route that the existing TheBus Route 13 travels will likely need to be updated. Within Hyattsville, the portion of the route that travels along 42nd Avenue would need to be partially or wholly re-routed to Baltimore Avenue. Currently, the route travels outside of Hyattsville to the northwest. To best serve Hyattsville residents and reduce route length, this would need to be re-routed to travel within Hyattsville through the Queens Chapel Manor neighborhood. This potential re-routing would need to be negotiated with the County and will require a discussion about the priorities of Route 13 and who it is intended to serve. The costs would be based on conversation and negotiation with Prince George's County. When conducting this study, Prince George's County DPW&T provided general cost of operating the transit service, which is described in detail below. If Prince George's County is amenable to working with the City, and the City and County can come to agreeable terms, this operational model is preferred.

The third option would be to contract out the ownership, maintenance, and operation of service to a private firm with experience operating similar transit service in the region. This model is used both in Bethesda and Baltimore. For reference, the request for proposal that was issued for the operation of Bethesda's circulator is included here as Appendix D. A cost estimate for the private model is included below.

Costs

Approximate cost estimates reflecting a County owned, maintained, and operated system as well as a privately owned, maintained, and operated service are included below. Both the County-operated and privately-operated cost estimates are based on the operator provided hourly operational costs multiplied by the service hours that would be needed to accommodate different headways and hours of operation.

The cost estimates for the privately-owned and operated system are based on an hourly operating cost provided by one of the private operators currently working in the region. The hourly rate varies between \$55/hour to \$75/hour depending on vehicle type.¹³ The Bethesda Circulator originally utilized specialty trolley vehicles, which did not hold up well over time. Several agencies in the TCRP study also noted that specialty trolleys were much more expensive to maintain. The Bethesda Urban Partnership recommends low-floor transit buses and currently uses the El Dorado vehicle, which is a relatively low-cost bus that provides low-floor capabilities. Similarly, Alexandria recommended low-floor vehicles with two doors, noting that these vehicles improved service over the original trolleys and two doors help reduce dwell time at stops.

The cost estimates for the County owned and operated system are based on an hourly operational cost of \$97.96/hour provided Prince George's County Department of Public Works and Transportation (DPW&T).¹⁴

Assuming the route operates with 14 stops, a travel time of 27 minutes (based on Google Maps) with a dwell time of 12.5 seconds per stop, and a 15% layover time at each terminal, the total cycle time is estimated to be just over 34 minutes.¹⁵ The cycle time was used to determine the number of vehicles required to meet the specified headways.

The tables below include cost estimates for the annual costs needed for County and private operation of the circulator. The costs are presented based on different service characteristics. The estimates for the privately-

¹³ The hourly cost estimates can be used to consider the costs of additional vehicles or service hours.

¹⁴ The cost estimates for a County-operated system are based on the assumption that this service would travel along Route Option 1, identified on page 19, not along the current route of TheBus Route 13.

¹⁵ These estimates are derived from Route Option 1 presented in this report.

operated system are provided in a range which will vary based on the type of vehicle selected, ranging from smaller shuttles up to a low floor transit bus. While the estimates are derived from rounded operating hours, these were based on two proposed operating schedules, as follows:

- The **Extended** hours of operation option is based on service hours from 7:00 am – 11:00 pm (Mon-Thurs); 7:00 am – 12:00 am (Fri); and 10:00 am – 12:00 am (Sat-Sun).
- The **Limited** hours of operation is based on service hours from 7:00 am – 10:00 pm (Mon-Thurs); 7:00 am – 11:00 pm (Fri); 10:00 am – 11:00 pm (Sat), with no service on Sundays.

Table 3: Annual Total Cost Comparison of a One-way Service

Hours of Operation	Operator	10 Minute Headways (4 vehicles)	15 Minute Headways (3 vehicles)
Extended	County	\$2,155,120 ^a	\$1,665,320 ^b
	Private	\$1,210,000 - \$1,650,000 ^a	\$935,000 - \$1,275,000 ^b
Limited	County	\$1,736,280 ^c	\$1,273,480 ^d
	Private	\$990,000 - \$1,350,000 ^c	\$715,000 - \$975,000 ^d

^a22,000 hours of service

^b17,000 hours of service

^c18,000 hours of service

^d13,000 hours of service

Table 4: Annual Total Cost Comparison of a Two-way Service

Hours of Operation	Operator	10 Minute Headways (8 vehicles)	15 Minute Headways (6 vehicles)
Extended	County	\$4,310,240 ^e	\$3,330,640 ^f
	Private	\$2,420,000 - \$3,300,000 ^e	\$1,870,000 - \$2,550,000
Limited	County	\$3,526,560 ^g	\$2,546,960 ^h
	Private	\$1,980,000 - \$2,700,000	\$1,430,000 - \$1,950,000

^e44,000 hours of service

^f34,000 hours of service

^g36,000 hours of service

^h26,000 hours of service

As shown in the table above, generally, a County-operated system is anticipated to be more expensive than a privately-operated system, mainly due to the higher cost per revenue-hour. However, based on the information provided by the County, DPW&T is currently spending approximately \$661,000 annually to operate Route 13. As a County-operated circulator would likely replace Route 13, the current operating cost of the route could potentially be considered as the County's contribution to a County-operated bus circulator system around Hyattsville. In this scenario, the City would conceivably be responsible for the balance of the annual cost. If such an agreement can be reached with the County, the County-operated system could be more cost effective than a privately-operated bus circulator system.

It should also be noted that a privately-operated circulator would have additional costs that fall outside of the scope of the estimates outlined above. These additional costs include installation and maintenance of signs and other stop amenities as well as the one-time costs associated with developing a logo and marketing materials, which will vary based on the reach of this campaign. The City may choose to develop marketing materials in-house or could seek in-kind donations or advertising to support marketing efforts.

Funding Sources

Various funding sources are available to offset costs and it is likely that a mixture of several sources will ultimately be necessary to fund a circulator. Potential funding sources are included below.

City Funds

A key funding source will come from any available City funds, which may include General Fund revenue, parking revenue, or other tax revenue.

State Funding

MDOT MTA issues a Statewide Transit Innovation Grant to support local transit efforts. The grant program is intended to support local transit initiatives that will improve transit reliability, improve access and connections to activity centers, and improve transit mobility options. \$2 million in state funds are available for FY 2019 and 2020 with a required local match.¹⁶

Fares

Based on best practices identified in the peer city interviews and TCRP study, a free fare is recommended. That said, the public survey responses indicate some willingness to pay a fare, as described in the Public Survey section of this report. Based on a 20 percent collection cost and the ridership estimates in this report, estimated monthly revenues from fare collection are included in the table below for varying levels of fares. **While this would offset costs, it would not be a major revenue source, and would make the circulator service less attractive to riders.** If fares are required, the City will need to consider payment options, which may include a cash only option or compatibility with SmarTrip cards (which could potentially increase startup costs).

Table 5: Fare Revenue Estimates

Fare	Low Ridership	High Ridership
\$0.50	\$4,800	\$15,200
\$1.00	\$9,600	\$30,400

Advertising Revenue and Naming Rights

While advertising revenue is an attractive option, it is unlikely that this revenue would be a major factor in overall system operating costs. Advertising revenue could pay for capital costs associated with signs and other stop amenities. Naming rights offered to a private contributor may be another funding option, particularly for developers or businesses located in the Gateway Arts District, as they will greatly benefit from the future circulator.

Federal Funding

Another option is to seek capital funding from the Federal Transit Administration (FTA). While there are several federal funding sources available, downtown circulator projects tend to use Small Starts grants. These grants are available to projects with a total project capital cost less than \$300 million and requesting less than \$100 million in federal funds. Small Starts funds can be used for up to 80 percent of capital costs, but in practice, the FTA typically limits these grants to 50% or less of total capital costs. Other potential Federal funding sources may include Better Utilizing Investments to Leverage Development (BUILD) Transportation Grants Program (formerly TIGER), Congestion Mitigation/Air Quality (CMAQ), Surface Transportation Program (STP), FTA Section 5307 for transit agencies, and Community Development Block Grants.

¹⁶ Maryland Department of Transportation Maryland Transit Administration. "Grants" <https://mta.maryland.gov/grants>

Other Funding Sources

Some cities leverage their development review processes to provide funding support for transit. Hyattsville could consider contributions to a transit fund as a mitigation requirement for large developments.

The City could seek partnership with developers and non-profits to contribute funding to the circulator's operation. Appropriate partners are those that stand to benefit from the circulator's operation.

RECOMMENDATIONS

This study has estimated planning-level ridership, costs, and revenue sources for a potential circulator connecting key destinations with Hyattsville's two Metrorail stations. Table 6 shows the summary of three ownership models reviewed in this study. Based on the review of the cost, operational control and oversight needs, partnering with Prince George's County to modify currently operating Route 13 is the most viable option for the Hyattsville.

Table 6: Ownership Model Comparison

Ownership Models	Capital Cost	Maintenance/ Operating Cost	Operational Control	Oversight Needs
Option 1 City Owned	High	High	High	High
Option 2 County Owned	Low	Medium *	Low	Low
Option 3 Privately Owned	Low	Low	Medium	Medium

If the City determines that the ridership estimates are favorable enough to justify the associated costs and wishes to pursue introduction of a transit circulator service, recommended next steps are included below.

1. **Identify dedicated funding sources.** For any type of transit circulator system to operate, Hyattsville needs to identify a dedicated long-term funding sources to finance the circulator. The cost of such a circulator would likely range from \$715,000 to operate a limited one-way privately-operated service to \$4,300,000 to operate an expanded two-way County-operated system. However, the cost of the County-operated system could change significantly based on the negotiation with the County to modify Route 13.
2. **Pursue a partnership with Prince George's County.** Because Prince George's County's TheBus Route 13 currently operates on a route similar to the potential future circulator route, the most cost-effective provision of a frequent transit connection to key destinations for the City would be achieved by upgrading the service currently offered by TheBus Route 13. This option relies on Prince George's County's earnest engagement and cooperation with the City.

In order for Route 13 to meet the standards of a high-quality circulator described in this report, headways would need to be reduced from 40 minutes to no more than 15 minutes, service hours would need to be expanded to include weekends and later hours on weeknights, and the route itself would need to be updated. The disadvantage to this arrangement is that the City of Hyattsville would lack direct control over routing, branding, or service.

The City should discuss this option with Prince George's County to understand its viability. Based on information provided by DPW&T and the cost estimates outlined on page 25, it would likely cost at least

\$615,000 for the City to cover the extra cost of DPW&T modifying Route 13 to meet the routing and operational recommendations in this report. While the incremental investment needed to improve the route is cheaper than contracting the service to a private operator, the route's total operational costs, including City and County contributions, would be greater than a privately-operated system.

3. **Hire Private Operator.** If the discussion with Prince George's County does not end in an amicable solution, Hyattsville should consider hiring a private company to operate the proposed transit circulator. This provides the City with more control over the service and they would be able to monitor the operation to ensure that a high-quality service is provided to residents, employees and visitors alike. At a minimum, this option would cost approximately \$715,000. Improved service may be provided if significantly more funds can be secured. Once funds are identified, a request for proposals for the operation of the circulator should be issued. This contract should include operation, maintenance, fueling, insurance, and management of the circulator vehicles.
4. **Finalize the circulator's operational characteristics.** Based the public survey results and circulator best practices identified by peer systems and in the TCRP report, the following operational characteristics are recommended to ensure any future circulator is attractive to potential riders.
 - a. Clockface-headways every 10-15 minutes,
 - b. Two-way circulation,
 - c. Hours of operation seven days a week, from early morning until late evening, with late night hours on Friday and Saturday nights,
 - d. Free fares, and
 - e. A strong branding and outreach campaign.

While a service that offers longer headways, one-way circulation, limited hours and requires a fare has the potential to be a less costly service to operate, this type of service would not offer a high-quality transit connection and would likely have lower ridership rates. However, the final operational characteristics may also be determined by the amount of dedicated funding that can be secured.

Transit circulators can bring many benefits to downtown areas and can facilitate mode-share shifts in communities. In Hyattsville's case, high-quality transit connections are lacking, and a circulator could serve to greatly enhance the transit connectivity between key destinations within the City. However, circulators have limited potential for fare recovery and are costly to operate with the service characteristics that make them successful (e.g., frequent service, extended operation and low cost to customers). The City of Hyattsville will need to identify long-term stable funding sources, create a strong identity, and offer reliable and convenient service for the circulator to attract and maintain steady ridership over the long run.



Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Jim Chandler

Submitting Department: Information Technology

Item Type: Purchase

Agenda Section: Consent Items (8:40 p.m. - 8:45 p.m.)

SUBJECT

Phone System Lease Agreement

HCC-137-FY19

Recommendation:

I move that the City Council authorize the City Administrator to execute a lease agreement for voice over IP phone system services with RingCentral, 20 Davis Drive, Belmont, CA 94002. The lease agreement will include a 36-month term, plus two additional 12 month terms and the annual cost will not exceed \$25,000.

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

[Memo - Phone System Lease Agreement.docx](#)

Summary Background:

As part of the upgrading of the City's Information Technology (IT) Infrastructure, we are scheduled to replace the City's existing Nortel Networks hard phone line system to a Voice Over IP (VoIP) system.

A VoIP phone or IP phone uses voice over IP technologies for placing and transmitting telephone calls over an IP network, such as the Internet, instead of the traditional public switched telephone network (PSTN). The City's new public works and police department facilities are being designed to support VoIP phone services.

It is staff's opinion that RingCentral demonstrated the best fit with its combination of intuitive functionality and pricing.

Staff is requesting approval of the City Council to proceed with the scope of services and authorization for the City Administrator to execute a lease agreement with RingCentral. The agreement which will include a 36-month term with two (2) additional one-year terms, at the request of the City of Hyattsville and the annual cost should not exceed \$25,000.

Next Steps:

We anticipate the new VoIP phone system to be operational by April 2019 in advance of both new municipal facilities coming online.

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?

Pending



Memo

To: Mayor and Council
From: Jim Chandler, Assistant City Administrator
CC: Tracey Nicholson, City Administrator
Ron Brooks, City Treasurer
Date: November 8, 2018
Re: Phone System Lease Agreement

This memorandum provides the City Council with a detailed summary of the Administration's replacement of a request for authorizing the City Administrator to execute a lease agreement for the purchase hardware and services.

Summary

As part of the upgrading of the City's Information Technology (IT) Infrastructure, we are scheduled to replace the City's existing Nortel Networks hard phone line system to a Voice Over IP (VoIP) system.

A VoIP phone or IP phone uses voice over IP technologies for placing and transmitting telephone calls over an IP network, such as the Internet, instead of the traditional public switched telephone network (PSTN). The City's new public works and police department facilities are being designed to support VoIP phone services.

Funding for hardware and contracted services is included in the FY2019 budget.

Since Spring 2018, City Staff have worked extensively with Dataprise Inc. to identify system requirements, identify providers that meet all operational requirements and complete a vetting of VoIP providers. In assessing system requirements and capabilities, the City assessed the following areas:

- Solution Type (Cloud/Premise)
- Usage
- Building Loss Impact
- Mobile/Remote Integration
- Conferencing Capability

- Business SMS
- Garten Magic Quadrant Position (Leader or Niche Player)
- Pricing: One-time and reoccurring

The following vendors were determined to meet each of the City's requirements and the City was provided with written proposals from each firm based on fifty-eight (58) standard lines:

Vendor	Solution Type	Position	One-Time Costs	Monthly Cost	5-Year Cost
Mitel – MiConnect Cloud	Cloud	Not Rated	\$3,430.00	\$2,181.38	\$134,418.80
Mitel – MiVoice Connect	Premise	Niche Player	\$59,211.37	\$904.00	\$113,451.67
RingCentral	Cloud	Leader	\$0.00	\$1,789.74	\$107,384.40
8 x 8	Cloud	Leader	\$4,749.24	\$1,655.39	\$104,072.64

Recommendation

While each of the systems met the system and operability requirements, it is Staff's opinion that RingCentral demonstrated the best fit with its combination of intuitive functionality and pricing.

Staff is requesting approval of the City Council to proceed with the scope of services and authorization for the City Administrator to execute a lease agreement with RingCentral. The agreement which will include a 36-month term with two (2) additional one-year terms, at the request of the City of Hyattsville.

We anticipate the new VoIP phone system to be operational by April 2019 in advance of both new municipal facilities coming on-line.



Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Zach Nemser

Submitting Department: Police Department

Item Type: Grant

Agenda Section: Consent Items (8:40 p.m. - 8:45 p.m.)

SUBJECT

FY19 Budget Appropriation: Target Corporation Donation

HCC-148-FY19

Recommendation:

I move that the Mayor and Council accept and appropriate into the FY19 budget a donation in the amount of \$1,500 from Target Corporation to the Community Action Team for the purpose of purchasing gift cards for children's use during the City's annual Shop with a Cop event.

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

Summary Background:

Each year, Hyattsville Police Department hosts its annual Shop with a Cop event. They collaborate with public safety agencies throughout Prince George's County to accompany children to shop for holiday gifts at the Target Store located at the Mall at Prince Georges (MPG). Donors generously fund this event, and many members from the community volunteer to ensure each child enjoys their shopping and lunch experience. All qualifying children are selected by our local participating elementary school administrators.

Next Steps:

Mayor and Council acceptance and appropriation of funds.

Fiscal Impact:

An additional appropriation and expenditure of \$1,500 in the Special Revenue Funds.

City Administrator Comments:

Recommend Approval

Community Engagement:

The annual Shop with a Cop Event is scheduled for December 15, 2018.

Strategic Goals:

Goal 3 – Promote a Safe and Vibrant Community

Legal Review Required?

Pending



Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Michelle Dunklee

Submitting Department: Police Department

Item Type: Grant

Agenda Section: Consent Items (8:40 p.m. - 8:45 p.m.)

SUBJECT

FY19 Budget Appropriation: Franklin's Restaurant

HCC-147-FY19

Recommendation:

I move that the Mayor and Council accept and appropriate into the FY19 budget a donation in the amount of \$547.20 from Franklin's Restaurant to Community Action Team for the purpose of purchasing gift cards for children's use during the City's annual Shop with a Cop event.

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

Summary Background:

Each year, Hyattsville Police Department hosts its annual Shop with a Cop event. They collaborate with public safety agencies throughout Prince George's County to accompany children to shop for holiday gifts at local City of Hyattsville businesses. Donors generously fund this event, and many members from the community volunteer to ensure each child enjoys their shopping and lunch experience. All qualifying children are selected by our local participating elementary school administrators.

Next Steps:

Mayor and Council acceptance and appropriation of funds.

Fiscal Impact:

An additional appropriation and expenditure of \$547.20 in the Special Revenue Funds.

City Administrator Comments:

Recommend Approval

Community Engagement:

The annual Shop with a Cop Event is scheduled for December 15, 2018.

Strategic Goals:

Goal 3 – Promote a Safe and Vibrant Community

Legal Review Required?

Pending



Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Michelle Dunklee

Submitting Department: Police Department

Item Type: Grant

Agenda Section: Consent Items (8:40 p.m. - 8:45 p.m.)

SUBJECT

FY19 Budget Appropriation: Aggressive Driving Enforcement Grant Award

HCC-158-FY19

Recommendation:

I move that the Mayor and Council amend the FY19 budget to accept and appropriate the grant award in the amount of 2,000 from the Maryland Highway Safety Office for the purpose of providing overtime funding for the enforcement of motor vehicle laws.

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

[MD Highway Safety Aggressive Driving.pdf](#)

Summary Background:

The Maryland Highway Safety Office (MHSO) administers grant-funded programs that address priority areas such as impaired driving prevention, occupant protection, aggressive driving prevention, distracted driving prevention and the safety of pedestrians, bicyclists, motorcyclists, younger drivers and older drivers. This is an annual, recurring grant. For FY19, the MHSO has awarded \$2,000 to the Hyattsville City Police Department.

Next Steps:

Mayor and Council acceptance and appropriation of funds.

Fiscal Impact:

\$2,000

City Administrator Comments:

Recommend Approval

Community Engagement:

N/A

Strategic Goals:

Goal 3 – Promote a Safe and Vibrant Community

Legal Review Required?

Pending



Maryland
Highway
Safety
Office

PROJECT AGREEMENT

6601 Ritchie Highway
Glen Burnie, MD 21062
PHONE 410-787-4050 FAX 410-787-4020

The formal approval of this Project Agreement and the obligation of funds to it are contingent upon the availability of anticipated federal funds, as determined by Congress, Maryland statute, or other federal or state action.

PROJECT TITLE: Aggressive

FOR MHSO USE ONLY

PROJECT NUMBER: LE-City of Hyattsville PD-2019-222

PROJECT AGENCY: City of Hyattsville Police Department

PROJECT AGENCY ADDRESS: 4310 Gallatin Street, Hyattsville, MD-20781

FUND RECIPIENT: City of Hyattsville Police Department

FUND RECIPIENT ADDRESS: 4310 Gallatin Street, Hyattsville, MD-20781

FEDERAL IDENTIFICATION NUMBER: 52-6000797

The undersigned agree that the Project Agency will carry out the Project within the dates of the Project Period, in accord with the general programmatic and financial requirements set forth in the agreement, and in compliance with the Project Conditions. Reimbursement is limited to actual eligible expenditures, the total of which is not to exceed the amount of Funds Obligated from MHSO. Furthermore, the Project Agency certifies that it is eligible under grant guidelines to receive grant funds; can accept a reimbursable grant; can successfully implement the project at the indicated funding level; and accepts the provisions of the entire Agreement including its Project Conditions. Costs cannot be incurred prior to the Project Start Date listed below.

BUDGET CATEGORIES	MHSO FUNDS
Salary and Benefits	\$0.00
Law Enforcement Overtime	\$2,000.00
Training / Conference and Accommodations	\$0.00
Mileage	\$0.00
Contractual Services	\$0.00
Equipment	\$0.00
Other Direct Costs	\$0.00
Indirect Costs	\$0.00
Total	\$2,000.00

The Project Director and Authorizing Official signing below cannot be the same person, nor can they be the Financial Official listed in the grant.

PROJECT DIRECTOR & AUTHORIZING OFFICIAL SIGNATURES

PROJECT DIRECTOR	AUTHORIZING OFFICIAL
NAME: Amal Awad	NAME: Candace Hollingsworth
TITLE: Chief	TITLE: Mayor
AGENCY: City of Hyattsville Police Department	AGENCY: City of Hyattsville Police Department
ADDRESS:	ADDRESS:
PHONE: (301) 985-5084 FAX:	PHONE: (301) 985-5000 FAX:
E-MAIL: aawad@hyattsville.org	E-MAIL: chollingsworth@hyattsville.org
SIGNATURE & DATE: Amal Awad (Electronically Signed) 09/27/2018	SIGNATURE & DATE: Candace Hollingsworth (Electronically Signed) 09/06/2018

FOR MHSO USE ONLY

PROJECT PERIOD START DATE: 10/01/2018	FUNDS OBLIGATED FROM MHSO:
PROJECT PERIOD END DATE: 09/30/2019	\$2,000.00
MHSO DEPUTY CHIEF APPROVAL (SIGNATURE & DATE)	
Kelly Melhern (Electronically Signed)	09/28/2018

**MARYLAND HIGHWAY SAFETY OFFICE
FFY 2019 PROJECT TERMS AND CONDITIONS**

I. Project Administration

It is understood and agreed by the Project Agency and Fund Recipient (Grantee) that grant funds received in support of this grant are subject to applicable federal and state laws and regulations and to the following applicable controls, terms and conditions:

1. Availability of Funds

- a. It is mutually understood between the Grantee and the Maryland Highway Safety Office (MHSO) that this grant may have been executed (the Terms and Conditions signed by the Grantee and the Project Agreement signed by both parties) for the mutual benefit of both parties before ascertaining the availability of anticipated federal funds, as determined by Congress, Maryland statute, or other federal or state action to avoid program and fiscal delays that would occur if the grant were executed after that determination was made.

The grant is valid and enforceable only if sufficient funds are made available to the state by the United States Government for the purpose of this program. In addition, this grant is subject to any additional restrictions, limitations, or conditions enacted by the Congress or to any statute enacted by the Congress or MHSO that may affect the provisions, terms, or funding of this grant in any manner.

Reimbursement extends only to those costs incurred during the period of the project, and for which quarterly reports are submitted no later than thirty (30) days after the end of the reporting period, and in the case of the fourth quarter report, thirty (30) days after the project period end date (September 30th).

The parties mutually agree that if the Congress does not appropriate sufficient funds for the program, this grant shall be amended to reflect any reduction in funds. If at any time during the term of this grant award, federal funds become reduced or eliminated, the MHSO may immediately terminate or reduce the grant award upon a thirty (30) day written notice to the Grantee.

The MHSO has the option to void the grant under the thirty (30) day cancellation clause or to amend the grant to reflect any reduction in funds.

Funds are awarded under Assistance Listings. The MHSO will provide quarterly Assistance Listings funding report to the Grantee.

- b. This grant will be conducted and administered in accordance with applicable federal, state and local laws, rules and other requirements, using acceptable financial management, record-keeping, procurement and property control systems as outlined in 49 CFR Part 18 - Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments or 49 CFR Part 19 - Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals and other Non-Profit Organizations (as applicable) and in accordance with the MHSO grant management guidelines.

2. Unallowable Costs

- a. Supplanting is defined as the replacement of routine and/or existing state or local expenditures with the use of federal grant funds for the cost of activities that constitute general expenses required to carry out the overall responsibility of a state or local agency. The Grantee shall not use grant funds to supplant state or local funds, or other resources that would otherwise have been made available for the grant program.
- b. In addition to supplanting, the following program administration costs are also prohibited:
- Entertainment costs including amusement and social activities and any costs directly associated with such costs (such as tickets to shows or sporting events, meals, lodging, rentals, transportation and gratuities)
 - Promotional items such as gifts, models, and souvenirs for public relations and advertising costs.
 - Alcoholic beverages for any consumption purposes including training settings for law enforcement

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

- Contributions and donations, including cash, property and services to others
 - Cost of fundraising, including financial campaigns and solution of capital contributions
 - Fines, penalties, damages and other settlements resulting from violations or non-compliance
 - Contingency provision for contributions to a contingency reserve or similar provision for unforeseen events excluding self-insurance reserves
 - Costs not recovered under one MHSO grant are unallowable under another MHSO grant
 - Highway construction, maintenance or design-related projects
 - Office furniture and fixtures
 - Automated traffic enforcement systems
 - Truck scales and traffic signal preemption systems
 - Cost of training for employees of federal and military agencies
- c. Prohibition on Using Grant Funds to Check for Helmet Usage (applies to subrecipients as well as States).
- The State and each subrecipient will not use 23 U.S.C. Chapter 4 grant funds for programs to check helmet usage or to create checkpoints that specifically target motorcyclists.

3. Procurement

The Maryland Highway Safety Office (MHSO) and its grantees are required to follow the Maryland state purchasing requirements for any purchases made with state and federal funding. These requirements apply to all types of purchases – equipment, supplies, printed materials, services, and any other items purchased for the use of the grant programs.

- a. All purchases shall have at least three prices/quotes, offer, or bids to ensure we are paying an acceptable price and performing as a good steward of State and Federal funds. This stewardship must be documented to show that good faith efforts have been made to make the best use of funds. This could include a simple step of researching on the internet and capturing screen shots of the item and pricing, as well as any shipping and handling costs. This assures that the item is purchased for the most reasonable price/value. These quotes/bids are valid for one year or in the case of grant funded items, for the life of the grant.

For MHSO purposes, for Category I items (under \$5,000) this includes soliciting information on vendor pricing through company websites, as long as the information shown on the pricing clearly indicates the product and the costs of any needed accessories and additional costs such as shipping and handling. Price comparisons must be “apples to apples” in terms of the same specifications for the products from each potential vendor.

- b. Preferred Providers: The State of Maryland maintains a policy of giving “preferred provider” status to agencies which benefit disadvantaged populations within the state where reasonable. These include Maryland Correctional Enterprises, Blind Industries and Services of Maryland, and Community Service Providers (including “individuals-with-disability-owned businesses”). See Procurement policy for more information.

It is a requirement of Maryland State Procurement Regulations to at least verify if the product or services being purchased are available through these agencies, and to get a competitive quote from them if they offer the product or service. These Preferred Providers are called “selling entity” within the regulations.

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

- c. For items over \$5,000, contact your MHSO Program Manager as these must be approved by NHTSA prior to purchase.

For all purchases, refer to the MHSO Small Procurement Process policy for more information prior to making a purchase. Failure to follow this process may result in denial of reimbursement.

4. Nondiscrimination (applies to subrecipients as well as States)

The State highway safety agency will comply with all Federal statutes and implementing regulations relating to nondiscrimination ("Federal Nondiscrimination Authorities"). These include but are not limited to:

- **Title VI of the Civil Rights Act of 1964** (42 U.S.C. 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin) and 49 CFR part 21;
- **The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970**, (42 U.S.C. 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
 - **Federal-Aid Highway Act of 1973**, (23 U.S.C. 324 *et seq.*), and **Title IX of the Education Amendments of 1972**, as amended (20 U.S.C. 1681-1683 and 16851686) (prohibit discrimination on the basis of sex);
- **Section 504 of the Rehabilitation Act of 1973**, (29 U.S.C. 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability) and 49 CFR part 27;
 - **The Age Discrimination Act of 1975**, as amended, (42 U.S.C. 6101 *et seq.*), (prohibits discrimination on the basis of age);
- **The Civil Rights Restoration Act of 1987**, (Pub. L. 100-209), (broadens scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal aid recipients, subrecipients and contractors, whether such programs or activities are Federally-funded or not);
- **Titles II and III of the Americans with Disabilities Act** (42 U.S.C. 1213112189) (prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing) and 49 CFR parts 37 and 38;
- **Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations** (prevents discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations); and
- **Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency** (guards against Title VI national origin discrimination/discrimination because of limited English proficiency (LEP) by ensuring that funding recipients take reasonable steps to ensure that LEP persons have meaningful access to programs (70 FR 74087-74100).

"During the performance of this contract/funding agreement, the contractor/funding recipient agrees—

- a. To comply with all Federal nondiscrimination laws and regulations, as may be amended from time to time;
- b. Not to participate directly or indirectly in the discrimination prohibited by any Federal non-discrimination law or regulation, as set forth in appendix B of 49 CFR part 21 and herein;
- c. To permit access to its books, records, accounts, other sources of information, and its facilities as required by the State highway safety office, US DOT or NHTSA;
- d. That, in event a contractor/funding recipient fails to comply with any nondiscrimination provisions in this contract/funding agreement, the State highway safety agency will have the right to impose such contract/agreement sanctions as it or NHTSA determine are appropriate, including but not limited to

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

withholding payments to the contractor/funding recipient under the contract/agreement until the contractor/funding recipient complies; and/or cancelling, terminating, or suspending a contract or funding agreement, in whole or in part; and

- e. To insert this clause, including paragraphs (a) through (e), in every subcontract and subagreement and in every solicitation for a subcontract or sub-agreement, that receives Federal funds under this program.

5. Buy America Act (applies to subrecipients as well as States)

The State and each subrecipient will comply with the Buy America requirement (23 U.S.C. 313) when purchasing items using Federal funds. Buy America requires a State, or subrecipient, to purchase only steel, iron and manufactured products produced in the United States with Federal funds, unless the Secretary of Transportation determines that such domestically produced items would be inconsistent with the public interest, that such materials are not reasonably available and of a satisfactory quality, or that inclusion of domestic materials will increase the cost of the overall project contract by more than 25 percent. In order to use Federal funds to purchase foreign produced items, the State must submit a waiver request that provides an adequate basis and justification to and approved by the Secretary of Transportation. The MHSO must assist Grantees with the waiver process. Any manufactured product with the exception of all motor vehicles, with a purchase price of \$5,000 or less per unit cost is waived from the Buy America Act requirement (23 U.S.C. 313: Pub. L. 110-161.)

6. Privacy Protection

All agencies and organizations with access to or use of any personal information whatsoever from the Maryland Motor Vehicle Administration records shall comply with MVA's Privacy Protection Policy as a condition precedent to receiving access or use and payment under this grant.

7. Debarment and Suspension

CERTIFICATION REGARDING DEBARMENT AND SUSPENSION (applies to subrecipients as well as States)

Instructions for Lower Tier (subrecipient) Participant Certification

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below and agrees to comply with the requirements of 2 CFR parts 180 and 1200.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal government, the department or agency with which this transaction originated may pursue available remedies, including suspension or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms *covered transaction*, *civil judgment*, *debarment*, *suspension*, *ineligible*, *participant*, *person*, *principal*, and *voluntarily excluded*, as used in this clause, are defined in 2 CFR parts 180 and 1200. You may contact the person to whom this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is proposed for debarment under 48 CFR part 9, subpart 9.4, debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

6. The prospective lower tier participant further agrees by submitting this proposal that it will include the clause titled "Instructions for Lower Tier Participant Certification" including the "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions and will require lower tier participants to comply with 2 CFR parts 180 and 1200.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not proposed for debarment under 48 CFR part 9, subpart 9.4, debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any prospective lower tier participants, each participant may, but is not required to, check the System for Award Management Exclusions website (<https://www.sam.gov/>).
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is proposed for debarment under 48 CFR part 9, subpart 9.4, suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal government, the department or agency with which this transaction originated may pursue available remedies, including suspension or debarment.

Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion -- Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

8. Drug-Free Workplace

The signatories for the grant certify that the Grantee will provide a drug-free workplace in accordance with the Federal Drug-free Workplace Act of 1988 (49 CFR Part 29 Subpart F).

9. Lobbying

CERTIFICATION REGARDING FEDERAL LOBBYING (applies to subrecipients as well as States)

Certification for Contracts, Grants, Loans, and Cooperative Agreements The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all sub-award at all tiers (including subcontracts, subgrants, and contracts under grant, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

RESTRICTION ON STATE LOBBYING (applies to subrecipients as well as States)

None of the funds under this program will be used for any activity specifically designed to urge or influence a State or local legislator to favor or oppose the adoption of any specific legislative proposal pending before any State or local legislative body. Such activities include both direct and indirect (e.g., "grassroots") lobbying activities, with one exception. This does not preclude a State official whose salary is supported with NHTSA funds from engaging in direct communications with State or local legislative officials, in accordance with customary State practice, even if such communications urge legislative officials to favor or oppose the adoption of a specific pending legislative proposal.

10. Political Activity (Hatch Act) (applies to subrecipients as well as States)

The State will comply with provisions of the Hatch Act (5 U.S.C. 1501–1508), which limits the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

11. Document Retention and Access

Pursuant to the requirements of 49 CFR Part 18, Sect. 18.42 - Retention and Access Requirements for Records, all records shall be retained for three years from the date the final quarterly report is submitted to the MHSO. If there is an action resulting from an audit or other action started before the expiration of the three-year period, the records shall be retained until completion of the action and resolution of all issues, or the end of the three-year period, whichever is later. The MHSO, other state agencies and appropriate federal authorities have the right of access to any books, documents, papers, or other records in order to perform audits and examinations or make excerpts and transcripts for as long as the records are retained.

12. Program Income

Some highway safety projects conduct activities that generate income to cover present and future costs. When Grantees earn money for their services or products, they may be earning what is defined in the federal regulations as "program income." Income earned by the Grantee with respect to the conduct of the grant (e.g. sale of publications, registration fees, service charges, etc.) must be accounted for fully and applied to project purposes or used to reduce costs. Program income that remains unexpended after the grant ends shall continue to be committed to the original grant objectives.

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

As defined in 23 CFR, Part 1200.24, program income means gross income earned by the Grantee from grant-supported activities. Such earnings may include but are not limited to:

- Income from service fees
- Sale of commodities fabricated under the grant
- Usage or rental fees of equipment (property) acquired with grant funds
- Conference or training registration fees when the grantee is the host agency

Grantees must record the receipt of program income as a part of the reimbursement claim process. Grantees are required to reduce the amount of grant funds requested for reimbursement based on the amount of income generated from the activity. A note in the reimbursement claim should be placed by the Grantee noting "program income" is offsetting the cost of this claim reimbursement.

13. Local Benefit Requirement

In order to support a high visibility enforcement campaign, coupled with a corresponding education model necessary to change driver behavior, the MHSO will coordinate paid and earned media statewide and in local jurisdictions to complement enforcement efforts. The outreach may include the following: TV and/or radio spots, digital ads, billboards, print ads, press releases, social media, posters and/or flyers. These outreach efforts will be coordinated statewide so as to ensure effective distribution of media spots for the local benefit. The project director signifies his/her understanding of the media component of the mobilization and approves the use of these public outreach techniques within his/her jurisdiction.

14. Audit

Provisions of the Single Audit Act of 1996 (P.L. 104-156) and OMB Circular A-133 - Audits of States, Local Governments, and Non-Profit Organizations, require an agency/organization which expends more than \$750,000 in federal funds in a year to provide a single or program-specific audit for each year. Any Grantee meeting this criterion shall ensure the submittal of one copy of each required audit report directly to the Federal Audit Clearinghouse within thirty (30) days of the report's issuance. The audit shall study and evaluate the internal accounting and administrative controls to the extent considered necessary to assess the integrity of the systems as required by generally accepted auditing standards, the standards for financial and compliance audits contained in the Standards for Audit of Governmental Organizations, Programs, Activities, and Functions issued by the U.S. General Accounting Office, the Single Audit Act of 1996, and the provisions of OMB Circular 2 CFR 200.501, 516. Grantees which are not subject to the provisions of OMB Circular A-133 shall provide an annual audit report of their organization's financial statements if requested.

15. Indirect Costs

If indirect costs were approved in the grant, the Grantee must furnish required documentation per MHSO's Indirect Cost Policy to receive MHSO's approved negotiation letter before indirect costs shall be reimbursed.

II. Project Management

1. Equipment Approvals, Management & Monitoring

- a. For all major equipment purchases and replacement purchases with a useful life of more than one year and an acquisition cost of \$5,000 or more in value, MHSO shall receive prior written approval from the NHTSA Regional Administrator. This procedure is required by 23 CFR §1200.31 and NHTSA's Highway Safety Grant Funding Policy for NHTSA/FHWA Field-Administered Grants. The regulations look to the cost of the equipment regardless of the portion of funding supported by Federal or other funds if the total cost was \$5,000 or more. The unit cost for equipment is the unit's purchase price plus any accessories necessary to make the equipment operational for its intended purpose. The Grantee shall ensure that the purchase has received the appropriate approvals prior to the

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

funds being expended. The Buy America Act must be adhered to at all times when purchasing approved equipment.

- b. All equipment, regardless of the description in the grant proposal requires a pre-approval in the e-grant system.
- c. Grantees are required to complete an Equipment Accountability Form when claiming reimbursement for the approved item(s). The Equipment Accountability Form is to be completed in MHSO's electronic grant system.
- d. It is the responsibility of the Grantee to institute and maintain required inventory records consistent with 49 CFR Part 18.32 DOT Implementation of Common Rule.
- e. The MHSO, as part of its oversight responsibility, shall systematically monitor Grantees with grant-funded equipment to ensure that grantees are in compliance with all federal requirements for property management and inventory. MHSO shall monitor Grantee compliance with applicable federal requirements during on-site monitoring visits. Equipment and other property acquired under a grant for use in highway safety projects shall be used and kept in operation for highway safety purposes. The Grantee agrees to comply with all requirements and accompany the MHSO to the on-site physical inventory inspection.
- f. All equipment approved for purchase by MHSO for the purpose of improving highway safety shall become property of the Grantee. Thus, all maintenance and care of the equipment shall rest with the receiving agency. MHSO recommends that the grantee agency maintain an inventory control system to ensure adequate safeguards to prevent loss, damage, or theft of the property. MHSO recommends that the inventory control system include a record and tagging system.
- g. Equipment shall be used by the Grantee for the purpose for which it was acquired as long as needed, whether or not the program continues to be supported by MHSO funds. When no longer needed for the original program, the equipment may be used in other traffic safety activities. Permission to dispose of the equipment must be obtained from MHSO before any action can be taken regarding the equipment. The Grantee must complete the bottom portion of MHSO's Equipment Accountability Form for disposal approval. If the equipment is no longer needed for the purpose for which it was acquired and will not be used for another highway safety project, the equipment may, at the option of the MHSO, become the property of the MHSO.

2. Other Direct Costs

All Materials under Other Direct Costs need to go through the MHSO approval process. Any items where the MVA/MHSO logo or highway safety messaging is warranted must go through the electronic grants pre-approval process. If the Grantee bypasses the pre-approval processes, the MHSO reserves the right to deny the reimbursement expenses. The Grantee should work with their MHSO Program Manager to ensure all pre-approvals are worked through the approval processes correctly.

3. Media & Advertising for Highway Safety Messages

Any funds obligated by this grant for the purchase of paid media are subject to the NHTSA-issued Guidelines for States Using Funds for Purchasing Advertising Space for Highway Safety Messages. The guidelines suggest a strategic communications approach that advocates the use of a sustained high visibility enforcement model coupled with communication resources to be implemented at targeted times and locations based on problem identification. The objective is to influence and sustain year-round behavioral change while getting return on investment and future improvements in highway safety.

4. Travel / Conference and Accommodations

- a. Grantee travel specifically detailed in the grant proposal may require a pre-approval in the electronic grant system. However, if a Grantee only provided minimal or generic travel information, the Grantee is required to submit a pre-approval request for the specific travel. The MHSO reserves the right to deny any travel or training expenses if the Grantee bypasses the MHSO's pre-approval process.
- b. Reimbursement for travel costs shall be subject to the requirements and limitations set forth in the State

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

Travel Regulations established by the Maryland Department of Budget and Management.

- c. Meals that are not provided during a training and or conference are the responsibility of the agency or the individual attending training or the conference, and will not be a reimbursable expense for the grantee except for very limited exceptions that must be pre-approved by the MHSO Chief or Deputy Chief.

5. Contractual Services

The Grantee may not enter into a contract with a contractor for any work specified in the grant without prior written consent from the MHSO. The Grantee shall furnish to the MHSO the contract for review and approval prior to contracting the work with the contractor. The MHSO reserves the right to deny reimbursement expenses if the Grantee bypasses MHSO's pre-approval process.

The Grantee, however, shall remain fully responsible for the work to be done by its contractor(s) and shall assure compliance with all the requirements of the grant and Project Terms and Conditions.

6. Project Modifications

If the costs reflected in the cost categories of the grant need to be adjusted, written approval shall be obtained from the MHSO prior to making any expenditure through a project modification. Budget modifications shall be obtained by submitting a Project Modification Request in the electronic grant system, detailing a clear justification to support the request. At no time shall salary and benefits be moved from one position to another without an approved project modification from the MHSO.

7. Other Conditions, as Directed

If the Grantee is a law enforcement agency, the following conditions apply:

- a. Any law enforcement agency receiving funds for overtime enforcement is strongly encouraged to follow the guidelines established for vehicular pursuits currently issued by the International Association of Chiefs of Police.
- b. Due to the number of fatal and serious crashes occurring during nighttime hours, especially involving impairment and speed, along with lower nighttime seat belt usage, a minimum of 50% of all grant funded overtime enforcement operations (except grant funded nighttime seatbelt operations) are intended to be conducted during the nighttime.
- c. Agencies receiving nighttime seatbelt funding must use 100% of that funding during nighttime hours. Nighttime refers to hours between 9:00 p.m. and 5:00 a.m.
- d. Law enforcement agencies using overtime funds are required to use the best available data to plan and implement enforcement operations (for example: location(s), day of week, time of day should be based on crash and/or citation data).
- e. Scheduled federally funded overtime should not exceed six (6) hours in a 24 hour time period.
- f. The high visibility enforcement model should be used with overtime enforcement operations funded by this grant. This means that when overtime is worked it should be supported by media outreach (for example: press releases, social media, radio and/or television). The MHSO can assist the law enforcement agency with outreach if requested. Participation in all mobilizations/traffic safety enforcement events sponsored by the NHTSA and/or the MHSO is required. An HVE detail consists of two or more officers.
- g. In the event an officer working an MHSO overtime funded assignment is called away from the overtime detail to handle another matter or agency work (calls for service, investigations, lengthy back-ups for incidents other than traffic stops, etc.), the time spent for the non-MHSO work may not be charged to MHSO. Only actual hours worked for the MHSO overtime assignment may be claimed on the law enforcement log for reimbursement. Officer and public safety should always remain a top priority, and responsible discretion should be exercised as to when an officer should be pulled from the MHSO funded effort.

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

- h. The Certification for the law enforcement overtime portion of any quarterly claim must be certified (signed) by a sworn command officer within that Agency.

III. Project Reporting

1. Quarterly Reports & Reimbursement Claims

- a. A quarterly reimbursement claim must be submitted by the Grantee to the MHSO by January 30, April 30, July 30, and October 30 (or monthly as agreed upon by the Grantee and the MHSO). Failure to submit timely, complete and accurate progress reports and claims within thirty (30) days after the quarter ends may constitute Grantee's irrevocable waiver of any right to thereafter recover from MHSO any part of those waived grant sums which may thereafter be reallocated or reverted by MHSO.
- b. A completed quarterly report shall be submitted by the Grantee whether or not reimbursable expenditures have been made since submittal of the prior period report.
- c. All quarterly reports shall be accompanied by approved supporting documentation (refer to the MHSO supporting document checklist for a full listing of approved documentation). The approved documentation must be uploaded in the electronic grant system.
- d. Requests for reimbursement shall be limited to those expenditures made consistent with the provisions of this Project Agreement and the cost principles set forth in 22 CFR Part 225 - Cost Principles for State, Local and Indian Tribal Governments (OMB Circular A-87), 2 CFR Part 220 - Cost Principles for Educational Institutions (OMB Circular A-21), or 2 CFR Part 230 - Cost Principles for Nonprofit Organizations (OMB Circular A-122), as applicable, and the Highway Safety Grant Funding Policy for NHTSA/FHWA Field-Administered Grants.
- e. All grants include a maximum amount eligible for reimbursement (reimbursement limitation). Reimbursement costs are the actual costs not to exceed the originally estimated costs. At no time can salary and benefits be moved from one position to another without an approved project modification from the MHSO.
- f. MHSO will withhold or disallow grant payments, reduce or terminate grant funds, and/or deny future grant funding anytime a Grantee fails to comply with any applicable term or condition of this grant.
- g. Claims received after the cutoff date may not be reimbursed. Grantees are responsible for informing their accounting office of the reimbursement claim submission deadlines.
- h. Expenditures incurred prior to the grant execution date, or for costs not outlined in the approved grant will be denied for reimbursement.

FFY 2019 PROJECT TERMS AND CONDITIONS (Cont'd)

We, the officials named below, hereby certify that we have read and understand the above described Project Terms and Conditions and are duly authorized to legally bind the Grantee to abide by them.

Amal Awad
Project Director's Name

09/27/2018
Date Signed

Amal Awad (Electronically Signed)
Project Director's Signature

Candace Hollingsworth
Authorizing Official's Name

09/06/2018
Date Signed

Candace Hollingsworth (Electronically Signed)
Authorizing Official's Signature



Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Katie Gerbes

Submitting Department: Community & Economic Development

Item Type: Planning & Development

Agenda Section: Consent Items (8:40 p.m. - 8:45 p.m.)

SUBJECT

Variance Request V-125-18: 3320 Gumwood Drive

HCC-161-FY19

Recommendation:

I move that 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-125-18, a zoning variance application for the subject property at 3320 Gumwood Drive, for a zoning variance of five (5) feet front yard depth and a waive of the parking area location requirement.

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

[V-125-18 Memo to Council.docx](#)

[V-125-18 Application.pdf](#)

[V-125-18 Statement From Applicant.docx](#)

[City of Hyattsville Zoning Variance Policy Statement & Variance Process_ENGLISH.pdf](#)

Summary Background:

The applicant, Jose Torres, has applied to the Prince George's County Board of Zoning Appeals for a zoning variance of five (5) feet front yard depth and a waiver of the parking area location requirement in order to construct a driveway on his property. Both of the variances requested are the result of pre-existing conditions of the site, and staff believe that the driveway will not have an adverse effect on surrounding homes or the environment, and are thereby recommending that the City Council support the variance application.

Next Steps:

Correspondence should be sent to the Board of Zoning Appeals prior to their hearing on December 5, 2018.

Fiscal Impact:

N/A

City Administrator Comments:

Recommend Approval

Community Engagement:

N/A

Strategic Goals:

Goal 3 – Promote a Safe and Vibrant Community

Legal Review Required?

Pending



Memo

To: Jim Chandler, Assistant City Administrator and Director, Community & Economic Development
From: Katie Gerbes, Community Planner
Date: November 27, 2018
Re: Zoning Variance Request V-125-18: 3320 Gumwood Road
Attachments: City of Hyattsville Variance Policy

The purpose of this memorandum is to provide the Director of Community & Economic Development with a briefing on the Zoning Variance request V-125-18, for the property located at 3320 Gumwood Road, Hyattsville.

Summary of Variance Conditions

The applicants, Jose Torres, has applied to the Prince George's County Board of Zoning Appeals for a zoning variance of 5 feet front yard depth and a waiver of the parking area location requirement in order to construct a driveway on his property.

The specific violation resides in the fact that the Zoning Ordinance prescribes that a front yard shall be at least 25 feet in depth. Due to a pre-existing front porch, the current depth of the front yard is only 20 feet. Furthermore, the Zoning Ordinance states that no parking area or driveway wider than its associated garage or carport may be built in the front yard of a dwelling. Though the applicant is seeking to build a driveway, which is typically allowed, there is no associated garage or carport, and therefore a waiver is requested.

The homeowner has adequately addressed the City's Variance Policy, (see attached).

Recommendation

Staff recommends the City Council's support of the applicant's variance request.

Both of the variances requested by the application are pre-existing conditions of the site. Additionally, Staff believe that the proposed driveway will not adversely affect the surrounding homes or environment, and are therefore supportive of this application.



THE PRINCE GEORGE'S COUNTY GOVERNMENT

100

BOARD OF ZONING APPEALS

BOARD OF ADMINISTRATIVE APPEALS

COUNTY ADMINISTRATION BUILDING, UPPER MARLBORO, MARYLAND 20772
TELEPHONE (301) 952-3220

NOTICE OF HEARING

RECEIVED
NOV 16 2018
BY: *[Signature]*

Date: November 13, 2018

Petitioner: Jose Torres

Appeal No.: V-125-18

Hearing Date: WEDNESDAY, NOVEMBER 28, 2018, AT 6:00 P.M. EVENING

Place: Council Committee Hearing Room # 2027
County Administration Building, Upper Marlboro, Md.

Appeal has been made to this Board for permission to validate existing conditions (front porch) and construct a 12' X 24' driveway in the front yard on the premises known as Lot 17, Block H, University Hills Subdivision, being 3320 Gumwood Drive, Hyattsville, Prince George's County, Maryland, contrary to the requirements of the Zoning Ordinance.

The specific violation resides in the fact that Zoning Ordinance Section 27-442(e)(Table IV) prescribes that each lot shall have a front yard at least 25 feet in depth and Section 27-120.01(c) of the Zoning Ordinance, which prescribes that no parking space, parking area, or parking structure other than a driveway no wider than its associated garage, carport, or other parking structure may be built in the front yard of a dwelling in the area between the front street line and the sides of the dwelling. A variance of 5 feet front yard depth and a waiver of the parking area location requirement are requested.

Public hearing on this Appeal is set for the time and place above stated. **Petitioner, or counsel representing Petitioner, should be present at the hearing. A Petitioner which is a corporation, limited liability company, or other business entity MUST be represented by counsel, licensed to practice in the State of Maryland, at any hearing before the Board. Any non-attorney representative present at the hearing on behalf of the Petitioner (or any other person or entity) shall not be permitted to advocate.**

Adjoining property owners, who are owners of premises either contiguous to or opposite the property involved, are notified of this hearing in order that they may express their views if they so desire. However, their presence is not required unless they have testimony to offer the Board.

If inclement weather exists on hearing date, please contact the office to ascertain if hearing is still scheduled.

BOARD OF ZONING APPEALS

By:

[Signature of Barbara J. Stone]

Barbara J. Stone
Administrator

cc: Petitioner
Adjoining Property Owners
Park and Planning Commission
City of Hyattsville

(USE BLACK INK ONLY)**PLEASE READ ALL INSTRUCTIONS
BEFORE FILLING OUT APPLICATION**

**TO: BOARD OF ZONING APPEALS FOR PRINCE
GEORGE'S COUNTY, MARYLAND**
County Administration Building, Room 2173
14741 Governor Oden Bowie Drive
Upper Marlboro, Maryland 20772
(301) 952-3220

Filing Fee Paid: \$ 200
CKM.O. # 1052
By: Jose Torres
3320 Gumwood Dr.
Hyattsville, MD 20783
Sign Posting Fee Paid: \$ 30
CKM.O. # 1055
By: Jose Torres
3320 Gumwood Dr.
Hyattsville, MD 20783
APPEAL NO. U-125-18
(OFFICE USE ONLY)

APPLICATION FOR A VARIANCE FROM STRICT APPLICATION OF THE ZONING ORDINANCE

(If variance is being applied for due to receipt of a Violation Notice, a copy of the notice is required.)

Owner(s) of Property José A. Torres
(AS SHOWN ON DEED)
 Address of Owner(s) 3320 GUMWOOD DR
 City HYATTSVILLE State MD Zip Code 20783
 Telephone Number (home) 301-536-7240 (cell) 301-536-7240 (work) _____
 E-mail address: JOSE.ROOFING@HOTMAIL.COM
 Attorney/engineer/contractor name, address and telephone number (applicant if different from above): (circle one)

N/A

For assistance in completing questions below, see corresponding paragraphs on *Instructions to Applicants*, which is designed to help you fill out this form. **SUBMITTED SITE PLANS/PLATS MUST BE DRAWN TO SCALE BY A CERTIFIED ENGINEER, SURVEYOR OR ARCHITECT (WITH OFFICIAL SEAL OR STATE OF MARYLAND REGISTRATION NUMBER SHOWN ON THE SITE PLAN/PLAT) AND MUST SHOW ALL STRUCTURES (TO INCLUDE ALL DIMENSIONS AND NUMBER OF STORIES) AS WELL AS OFF-STREET PARKING AND ANY PROPOSED CONSTRUCTION ON THE PROPERTY. THE PLAN MUST NOTE THE SCALE, THE LOT SIZE, THE LEGAL DESCRIPTION AND A NORTH ARROW.**

Location of Property involved: a) Street Address 3320 GUMWOOD DR
 City HYATTSVILLE MD 20783
 b) Lot(s) 17 Block H Parcel _____
 Subdivision Name UNIVERSITY HILLS
 c) Association Name(s) & Address(es) (Homeowners/Citizens/Civic and/or Community):
N/A
 d) Municipality (Incorporated City/Town) Name HYATTSVILLE

What will be/has been constructed on the property? (Variance(s) Required) proposed d/w
12' X 24'

Do you need the services of a foreign language interpreter at your hearing? (Additional \$30 fee required)

Yes _____ No ☒

Foreign Language: _____



Signature of Owner/Attorney

JOSE ANDRES TORRES.

Printed Name

IMPORTANT: Failure to provide complete and accurate information on this application may delay or jeopardize consideration of the request. Applications on which all required information is not furnished will be returned for completion before processing. Filing fees must be made payable to Prince George's County and sign posting fees must be made payable to M-NCPPC. Approval of a variance is not a guarantee that further review will not be necessary by other governmental authorities. For further information regarding Board of Zoning Appeals policies and procedures, see Sections 27-229 through 27-234 of the County Zoning Ordinance and/or the Board's website at <http://pgccouncil.us/>.

FOR COUNTY USE ONLY

Property Zone: R55 Overlay Zone: G

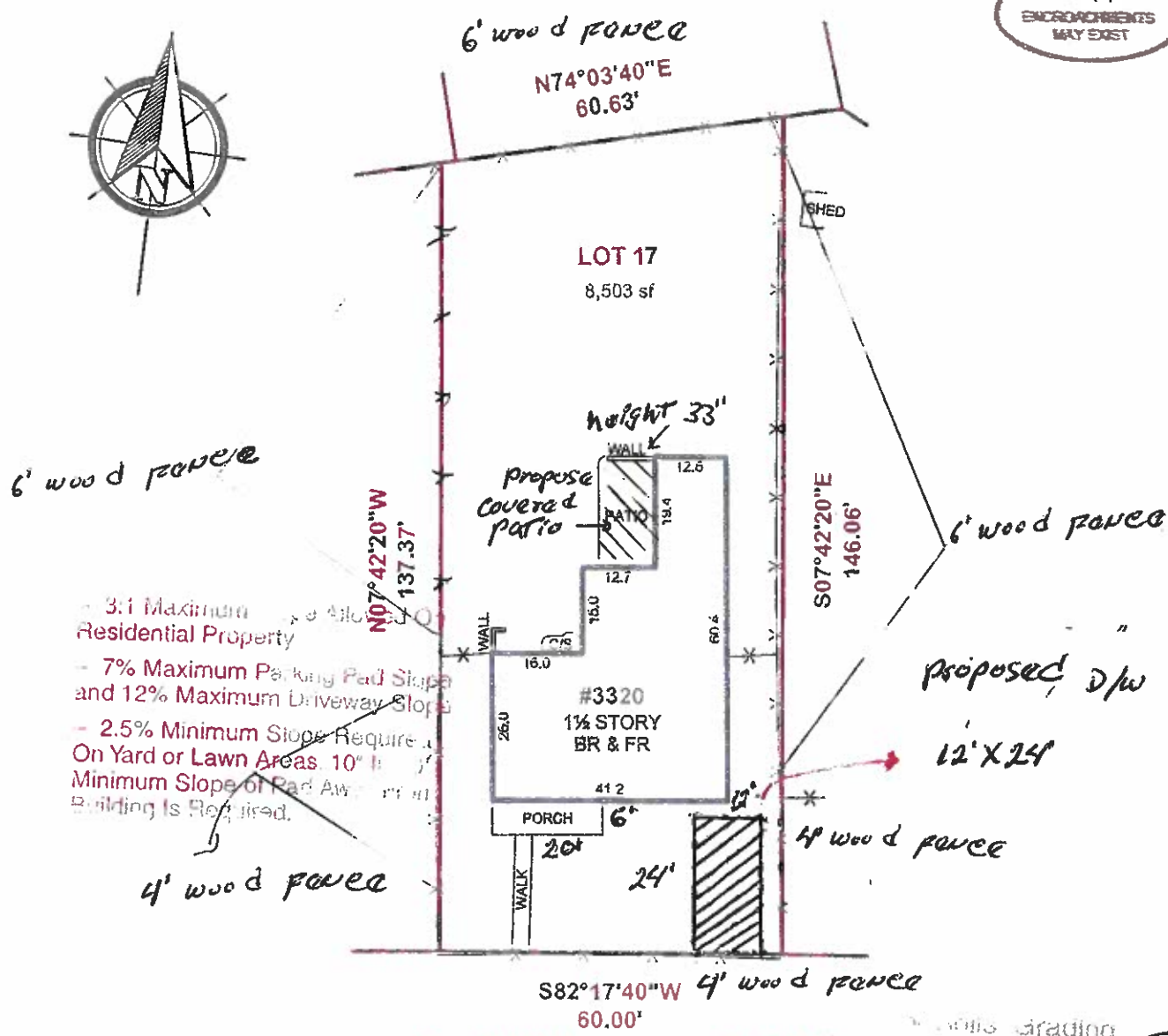
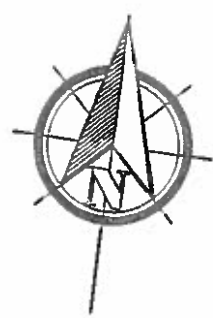
Has the property in question ever been subject to previous Board, County Council or Zoning Hearing Examiner action? No If so, give Case No.(s)/Decision Date(s) MA

Is the property subject to any action by the Planning Board? _____

If so, what type of action? _____

Variance(s) requested: FRONT YARD / PARKING LOCATION

FOR A LIST OF ALL NAMES AND MAILING ADDRESSES OF ADJOINING PROPERTY OWNERS AND OTHER PARTIES, PLEASE SEE THE PERSONS OF RECORD LIST



3:1 Maximum Slope for Residential Property
- 7% Maximum Parking Pad Slope and 12% Maximum Driveway Slope
- 2.5% Minimum Slope Required On Yard or Lawn Areas. 10" Minimum Slope of Pad Area if Building Is Required.

GUMWOOD DRIVE

[Signature]
41893-2018
8-21-18

LOCATION DRAWING OF:
#3320 GUMWOOD DRIVE
LOT 17
BLOCK H
UNIVERSITY HILLS
PLAT BOOK 12, PLAT 61
PRINCE GEORGE'S COUNTY, MARYLAND
SCALE: 1"=30' DATE: 4-5-17
DRAWN BY: AP FILE #: 172399-688

LEGEND:
- FENCE
- BASEMENT ENTRANCE
- BAY WINDOW
- BRICK
- BLDG. RESTRICTION LINE
- BASEMENT
- CONCRETE STOOP
- DRIVEWAY
- FRAME
- MACADAM
- OVERHANG
- PUBLIC UTILITY ESMT.

COLOR KEY:
(RED) - RECORD INFORMATION
(BLUE) - IMPROVEMENTS
(GREEN) - ESMTS & RESTRICTION LINES

A Land Surveying Company
DULEY and Associates, Inc.
Serving D.C. and MD.
14604 Elm Street, Upper Marlboro, MD 20772
Phone: 301-888-1111 Fax: 301-888-1114
Email: orders@duley.biz On the web: www.duley.biz



SURVEYOR'S CERTIFICATE

I HEREBY STATE THAT I WAS IN RESPONSIBLE CHARGE OVER THE PREPARATION OF THIS DRAWING AND THE SURVEY WORK REFLECTED HEREIN AND IT IS IN COMPLIANCE WITH THE REQUIREMENTS SET FORTH IN REGULATION 12 CHAPTER 09.13.06 OF THE CODE OF MARYLAND ANNOTATED REGULATIONS. THIS SURVEY IS NOT TO BE USED OR RELIED UPON FOR THE ESTABLISHMENT OF FENCES, BUILDING, OR OTHER IMPROVEMENTS, THIS PLAT DOES NOT PROVIDE FOR THE ACCURATE IDENTIFICATION OF PROPERTY BOUNDARY LINES, BUT SUCH IDENTIFICATION MAY NOT BE REQUIRED FOR THE TRANSFER OF TITLE OR SECURING FINANCING OR REFINANCING. THIS PLAT IS OF BENEFIT TO A CONSUMER ONLY INsofar AS IT IS REQUIRED BY A LENDER OR A TITLE INSURANCE COMPANY OR ITS AGENTS IN CONNECTION WITH THE CONTEMPLATED TRANSFER, FINANCING OR REFINANCING. THE LEVEL OF ACCURACY FOR THIS DRAWING IS 1". NO TITLE REPORT WAS FURNISHED TO NOR DONE BY THIS COMPANY. SAID PROPERTY SUBJECT TO ALL NOTES, RESTRICTIONS AND EASEMENTS OF RECORD. BUILDING RESTRICTION LINES AND EASEMENTS MAY NOT BE SHOWN ON THIS SURVEY. IMPROVEMENTS WHICH IN THE SURVEYOR'S OPINION APPEAR TO BE IN A STATE OF DISREPAIR OR MAY BE CONSIDERED "TEMPORARY" MAY NOT BE SHOWN. IF IT APPEARS ENCROACHMENTS MAY EXIST, A BOUNDARY SURVEY IS RECOMMENDED.

DULEY & ASSOC.
WILL GIVE YOU A 100% FULL CREDIT TOWARDS UPGRADING THIS SURVEY TO A "BOUNDARY/STAKE" SURVEY FOR ONE YEAR FROM THE DATE OF THIS SURVEY

NOV 13 104 18

V-125-18
JOSE TORRES
3320 GUMWOOD DRIVE
HYATTSVILLE MD 20783

V-125-18
VEDA GASTON
3317 GUMWOOD DRIVE
HYATTSVILLE MD 20783

V-125-18
THOMAS FENIMORE
844 POWERS STREET
BALTIMORE MD 21211

V-125-18
DONALD ASHBY
3318 GUMWOOD DRIVE
HYATTSVILLE MD 20783

V-125-18
JEFFREY & JEANNE SMITH
619 GLENBROOK DRIVE
MIDDLETOWN MD 21769

V-125-18
LESLIE MORRIS
3317 PENNSYLVANIA STREET
HYATTSVILLE MD 20783

V-125-18
ELIGIO RIVERA
3319 PENNSYLVANIA STREET
HYATTSVILLE MD 20783

V-125-18
CITY OF HYATTSVILLE
ECONOMIC REVIEW
4310 GALLATIN STREET
HYATTSVILLE MD 20781

November 27, 2018

Katie,

I desire to construct a driveway at my location 3320 Gumwood drive because by having a driveway it will keep my property safe from damages and theft. As of now the road that is in front of my property is very narrow and tight causing many vehicles to speed by and damaging my vehicles. Recently I have had other vehicles hit and damaged my vehicles as they speed by the road. In addition, many times there are many other vehicles that park all along the side of the road in front of my house causing the entire road to be full. Since it is a college atmosphere many students fill the roads with their cars and taking up all the parking. This effects me and my tenants by not having any space to park if not closely to my house.

Most importantly I need this variance approved because my tenants, childrens and I can be safe from future damages and have enough space for parking.

I have attached 2 images of the board of hearing for construction appeal and a copy of the property house plan.

Thank you,

Jose Torres



City of Hyattsville

Zoning Variance Policy Statement and Variance Process

The Mayor and Council adopted the following City of Hyattsville Policy and Process for Zoning Variance Requests: City of Hyattsville Zoning Variance Policy Statement:

The City of Hyattsville affirms the role of the Prince George's County Planning Board zoning authority and "the purposes, intent, standards and design criteria set forth in the Zoning Ordinance and appropriate County policies."

The City of Hyattsville affirms the current zoning policy within the City limits and as a matter of policy does not support zoning variances as a normal business practice.

The City's support of a zoning variance ordinarily be granted only after the Mayor and City Council acknowledge that the granting of a variance:

1. remedies a unique situation that zoning did not anticipate;
2. remedies that which creates a significant hardship on the property-owner that can be documented and clearly demonstrated;
3. will result in benefits to the residents and improve the quality of the environment of the City.

Citizens requesting such support shall submit:

1. current plat of site with all existing conditions;
2. photos of all existing site conditions;
3. scale plans and elevations of existing conditions and proposed changes;
4. narrative description of the proposed changes, specifics of the zoning variance requirements and an explanation of how the zoning variance request responds to:
 - a. a unique situation that zoning did not anticipate;
 - b. a significant hardship on the property owner;
 - c. benefits to the residents and improve the environment of the City

The City shall as a matter of policy provide letters of support for residents to document a "non-conforming lot" as part of the normal permitting process for projects complying with all other aspects of zoning regulations, unless the matter at hand is the certification of a non-conforming use on a non-conforming lot. The standard for the support of the certification of a non-conforming use on a non-conforming lot would revert to the instant aforementioned requirements for City support of a zoning variance.

The City will not support variance requests for additional lot coverage when the intention of the request is to add off-street parking on the lot, except in extraordinary circumstances.

City of Hyattsville Zoning Variance Process

Requests for zoning variances shall be processed by the Office of Code Enforcement and reviewed by the staff for technical issues. The Office of Code Enforcement shall determine if the request complies with all of the requirements of City of Hyattsville Zoning Variance Policy or to document a "non-conforming lot". The Supervisor shall then issue a report for the City Administrator citing one of the following "Actions":

- A. The request for the City's support of the zoning variance does not comply with City's policy, Do Not Recommend Approval
- B. The request for the City's support of the zoning variance does comply with City's policy, Recommend Approval - Zoning Variance
- C. The request for the City's support of the zoning variance does comply with City's policy for "non-conforming lots", Recommend Approval - Non Conforming Lot

The City Administrator shall review the Office of Code Enforcement Supervisor's Report and determine which of the following actions is applicable and execute accordingly:

- A. Do Not Recommend Approval - The City Administrator shall draft a letter detailing the City's opposition for the proposed request for a zoning variance for the Mayor's consideration and signature. The City letter opposing the proposed request for a zoning variance shall be placed on the Consent Items Agenda for approval by the City Council.
- B. Recommend Approval - Zoning Variance - The City Administrator shall forward the Office of Code Enforcement Supervisor's Report for the proposed request for a zoning variance to the (Planning Committee for review and comment along with any other City staff comments) the Mayor and City Council for action.
- C. Recommend Approval - Non Conforming Lot - The City Administrator shall draft a letter detailing the City's support for the proposed request for a zoning variance for a "non-conforming lot" to the Mayor for his review and signature. The City letter supporting the proposed request for a zoning variance shall be placed on the Consent Items Agenda for approval by the City Council.

Adopted by the Mayor and Council on February 13, 2006

Amended by the Mayor and Council on October 3, 2011



Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Jim Chandler

Submitting Department: Community & Economic Development

Item Type: Memorandum of Understanding

Agenda Section: Consent Items (8:40 p.m. - 8:45 p.m.)

SUBJECT

University of Maryland Shuttle Program MOU – 2019 Extension

HCC-164-FY19

Recommendation:

I move the City Council authorize the City Administrator to execute a MOU extension with University of Maryland Department of Transportation Services for the purpose of continuing the City's participation in the UMD Shuttle program through December 31, 2019 at a cost not to exceed \$6,000.

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

[Memo - UMD Shuttle MOU Extension - 11.28.2019.docx](#)

Summary Background:

Since 2015, the City of Hyattsville has participated in the University of Maryland Department of Transportation Shuttle Service program which provides City residents with access to the existing UMD Shuttle 113 route at no direct cost to the user. The City contributes \$6,000 annually to the program and provides Hyattsville residents with a UMD pass.

As of November 28, 2018, the City has issued 191 UMD Shuttle passes to Hyattsville residents.

Next Steps:

N/A

Fiscal Impact:

\$6,000

City Administrator Comments:

Recommend Support

Community Engagement:

Throughout this past year, the City has actively advertised the UMD Shuttle as a free option for Hyattsville residents.

Strategic Goals:

Goal 4 – Foster Excellence in all City Operations

Legal Review Required?

Pending



Memo

To: Mayor and Council
From: Jim Chandler, Assistant CA, Director, Community & Economic Development
CC: Tracey Nicholson, City Administrator
Ron Brooks, City Treasurer
Date: November 28, 2018
Re: University of Maryland Shuttle Program MOU – 2019 Extension

The purpose of this memorandum is to provide the Mayor and City Council with an update summary of the City's participation in the University of Maryland (UMD) Shuttle 113 Route and a recommendation for the City to continue to participate in the program through December 31, 2019.

Summary

Since 2015, the City of Hyattsville has participated in the University of Maryland Department of Transportation Shuttle Service program which provides City residents with access to the existing UMD Shuttle 113 route at no direct cost to the user. The City contributes \$6,000 annually to the program and provides Hyattsville residents with a UMD pass.

The Route 113 of the University of Maryland Shuttle Bus loops through Hyattsville, stops at the Prince George's Plaza Metro, and then heads to the University. Hyattsville residents are eligible to receive a pass to ride free by bringing photo ID and proof of residence to the Municipal Building, 4310 Gallatin Street, Monday through Friday, 8:30 a.m. – 5:00 p.m.

The following represents registered Hyattsville users by calendar year:

- 2015: 105

- 2016: 42
- 2017: 47
- 2018: 191

The Action is necessary by the City Council to authorize the City Administrator to execute the Memorandum of Understanding (MOU) for the current term.

Recommendation

Throughout this past year, the City has actively advertised the UMD Shuttle as a free option for Hyattsville residents. As a result, we have experienced a significant increase in UMD Shuttle Registrations through the City of Hyattsville and are of the opinion that the increase warrants the City's continued participation in the program offered by the UMD Department of Transportation. Staff is recommending the City Council authorize the City Administrator to execute a MOU extension with UMD to continue the City's participation in the program through December 31, 2019.



Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Chris Purvis

Submitting Department: Police Department

Item Type: Contract

Agenda Section: Consent Items (8:40 p.m. - 8:45 p.m.)

SUBJECT

Red Light Camera Contract - Annual Renewal

HCC-159-FY19

Recommendation:

I move that the Mayor and Council authorize the City Administrator to renew the City's agreement with Verra Mobility to provide digital camera traffic enforcement services, related citation management and back office processing for the Red Light Camera Program for 2019.

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

[HYATTSVILLE Amendment Renewal.docx](#)

[Memo to Tracey Nicholson.docx](#)

Summary Background:

The City of Hyattsville entered into a contract with Lasercraft, Inc., (now Verra Mobility) on September 1, 2006, to provide digital camera traffic enforcement services, related citation management and back office processing for the Red Light Camera Program. The City of Hyattsville entered in to three more extensions with ATS in 2014, 2015 and 2016. We have the option to extend the contract if we so desire. The program is self-sustaining, meaning it does not cost us anything out of pocket to operate these red light cameras; rather, the program is funded by fines levied on violators.

Next Steps:

Pending per Mayor and Council Approval.

Fiscal Impact:

None

City Administrator Comments:

Recommend Approval

Community Engagement:

N/A

Strategic Goals:

Goal 3 – Promote a Safe and Vibrant Community

Legal Review Required?

Complete

**FOURTH AMENDMENT TO AGREEMENT
BETWEEN HYATTSVILLE, MARYLAND
AND AMERICAN TRAFFIC SOLUTIONS, INC.
d/b/a VERRA MOBILITY**

This Fourth Amendment ("Amendment") is effective as of the date of final execution hereof and entered into between the City of Hyattsville, a municipal corporation of the State of Maryland ("Municipality") and American Traffic Solutions, Inc., doing business as Verra Mobility, a Kansas corporation (herein "VERRA MOBILITY").

WHEREAS, VERRA MOBILITY entered into an agreement with Howard County, Maryland as of January 5, 2016 (hereinafter the "Howard County Agreement"); and

WHEREAS, the Municipality and VERRA MOBILITY entered into an Agreement, subject to the terms and conditions of the Howard County Agreement, effective January 5, 2016, which was amended by the First Amendment to Agreement dated as of April 1, 2016, the Second Amendment to Agreement dated as of December 22, 2016 and the Third Amendment to Agreement dated as of December 12, 2017 (together the "Agreement"); and

WHEREAS, the Municipality and VERRA MOBILITY wish to modify and amend certain terms and conditions of the Agreement; and

WHEREAS, Section 3.2 of the Howard County Agreement allows seven (7) one-year renewal options; and

NOW, THEREFORE, in consideration of the mutual covenants, warranties, representations, and conditions contained in the Agreement, the parties hereto agree as follows:

1. The Agreement is hereby extended for a one-year period beginning January 1, 2019, and ending December 31, 2019.
2. Except as expressly amended or modified by the terms of this Amendment, all terms of the Agreement shall remain in full force and effect. In the event of a conflict between the terms of this Amendment and the Agreement, the terms of this Amendment shall prevail and control.
3. This Amendment may be executed in one or more counterparts, each of which shall constitute an original, but all of which taken together shall constitute one and the same instrument. Each party represents and warrants that the representative signing this Amendment on its behalf has all right and authority to bind and commit that party to the terms and conditions of this Amendment.

IN WITNESS WHEREOF, authorized representatives of the parties have set forth their signatures below, intending to be legally bound.

AMERICAN TRAFFIC SOLUTIONS, INC.

HYATTSVILLE, MARYLAND

By: _____
Elizabeth Caracciolo Date
EVP/GM, Government Solutions

By: _____
Date



Candace B. Hollingsworth
Mayor

Tracey Nicholson - Douglas
City Administrator

Memo

To: Tracey Nicholson
From: Lieutenant Chris Purvis
Date: November 21, 2018
Re: Red Light Camera Contract Extension with Verra Mobility

Purpose

The purpose of this memorandum is to provide you with a brief overview of the Agreement between Verra Mobility, (Formerly American Traffic Solutions/ ATS), Howard County Department of Police and the City of Hyattsville and to extend the Agreement for another year.

Background

The City of Hyattsville entered into a contract with Lasercraft, Inc., (now Verra Mobility) on September 1, 2006, to provide digital camera traffic enforcement services, related citation management and back office processing for the Red Light Camera Program. The City of Hyattsville entered in to three more extensions with ATS in 2014, 2015 and 2016. We have the option to extend the contract if we so desire. The program is self-sustaining, meaning it does not cost us anything out of pocket to operate these red light cameras; rather, the program is funded by fines levied on violators.



The City currently has three Red Light Cameras located at:

1. North Bound Baltimore Avenue @ Hamilton Street
2. North Bound Queens Chapel Road @ Queensbury Road
3. East Bound East-West Highway @ Queens Chapel Road

Recommendation

I am recommending that we continue the services of ATS. The contract extension has been reviewed and approved for legal sufficiency by Skip Cornbrooks, City Attorney.





Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Ordinance

Agenda Section: Action Items (8:45 p.m. - 9:20 p.m.)

SUBJECT

Hyattsville Ordinance 2018-06, Repeal and Replace Chapter 8, Elections (5 minutes)

HCC-150-FY19

Recommendation:

I move that the Mayor and Council adopt 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. (SECOND READING/ADOPTION).

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:

A First Reading was held on November 19, 2018. Adoption is scheduled for 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.

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ARTICLE III

City Supplemental Voter Registry

- § 8-8. Supplemental Voter Registry.
- § 8-9 Application and Procedure.

ARTICLE IV

Provisional Ballots

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

ARTICLE V

Vote-by-Mail Ballots

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

ARTICLE VI

Campaign Material and Other Persuasive Election Material

- § 8-22. Authority Lines.
- § 8-23. Posting Campaign Materials.

ARTICLE VII

Campaign Finance

- § 8-24. Appointment of a Treasurer.
- § 8-25. Duties and Authority of a Campaign Treasurer.
- § 8-26. Reports Required.
- § 8-27. Filing Reports.
- § 8-28. Form and Contents of Reports.
- § 8-29. Review of Reports; Financial Advisors.
- § 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;

1 (d) vacations;

2 (e) tickets or admission to entertainment, such as a concert or theater performance; and

3 (f) salary payments to a member of the candidate's family.

4 B. Campaign funds may not be utilized in any election other than one held by the City.

5 C. Cash withdrawals are prohibited.

6 D. Campaign funds shall not be used to pay a fine for a violation of this Chapter.

7 E. No person other than a candidate, treasurer, or other agent with specific written authorization
8 by the candidate shall make an expenditure from any campaign account.

9 F. Retention and disposition of surplus funds. (1) After an election, surplus funds may be
10 retained and may be used by the candidate in any election to support the candidate's election
11 or reelection to any City office. The candidate and the candidate's treasurer shall meet all
12 applicable requirements of this Chapter with respect to maintaining and accounting for the
13 surplus funds including, but not limited to filing all annual reports. (2) The candidate may
14 also choose to dispose of surplus funds in accordance with § 8-32F(2)(a) – (d).

15 (a) Returned, pro rata, to the contributors by the treasurer;

16 (b) Paid to a charitable organization registered or exempt from registration pursuant to
17 Maryland Code, Title 6 of the Business Regulation Article, which may be amended
18 from time to time;

19 (c) Paid to a local board of education or to a recognized nonprofit organization
20 providing services or funds for the benefit of pupils or teachers; and/or

21 (d) Paid to any public or private institution of higher education in the State for
22 scholarship or loan purposes.

23 (3) Except where surplus campaign funds are returned to contributors, such funds shall not
24 be converted to personal use.

25 (4) Candidates or their treasurers shall make a record of all dispositions of surplus
26 campaign funds.

27 (5) Within 30 days of the disposition of all of a candidate's surplus funds, or on or before
28 the first Tuesday in September following the complete disposition of the candidate's
29 surplus funds, whichever is earlier, the candidate or the candidate's treasurer shall file:

30 (a) an annual report as set forth in § 8-27(A)(3) and 8-28 of this Article VII; and

31 (b) an affidavit with the City Clerk stating that the campaign accounts are closed and
32 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.

1 **ARTICLE IX**

2 **Enforcement, Prohibited Conduct, Penalties, and Appeals**

3 **§ 8-35. Enforcement.**

4 The Board may enforce the provisions of this Chapter by:

5 A. issuing cease and desist orders;

6 B. imposing fines as set forth in this Article;

7 C. imposing conditions, mandates, or prohibitions on any violator as the Board determines
8 to be appropriate, including requiring a violator to take corrective action;

9 D. seeking judicial enforcement of its decisions by application to courts of competent
10 jurisdiction for injunctions, mandamus, and other appropriate judicial review when
11 conducting an administrative review; and

12 E. referral of complaints to the Office of the State's Attorney for prosecution as the
13 circumstance may warrant.

14 **§ 8-36. Prohibited Conduct.**

15 A. It is unlawful to violate any provision of this Chapter.

16 B. It is unlawful for any person to knowingly and willfully:

17 (1) sign, under oath, affirmation, and/or the penalties of perjury any application, affidavit,
18 or other document pursuant to this Chapter that contains false information;

19 (2) violate any provision of this Chapter with the intent to cast an illegal vote;

20 (3) apply for, cast, or attempt to cast a ballot, including a provisional or Vote-by-Mail
21 ballot, under any name other than their own name;

22 (4) cast or attempt to cast a Vote-by-Mail ballot that was not issued by the City for that
23 person;

24 (5) publish or distribute, for the purpose of influencing votes, any material that contains a
25 false or substantially misleading authority line;

26 (6) canvass or open any Vote-by-Mail ballot or envelope, other than their own, prior to the
27 time for canvassing set forth in Article V of this Chapter;

28 (7) accept, make, or solicit any contribution prohibited by this Chapter or State or federal
29 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

28
29
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: December 3, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Ordinance

Agenda Section: Action Items (8:45 p.m. - 9:20 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 adopt 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. (SECOND READING/ADOPTION).

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:

A First Reading was held on November 19, 2018. Adoption is scheduled for 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: December 3, 2018

Submitted by: Ron Brooks

Submitting Department: Finance

Item Type: Bond

Agenda Section: Action Items (8:45 p.m. - 9:20 p.m.)

SUBJECT

Hyattsville Ordinance 2018-08: Adoption of Ordinance to Authorize General Obligation Debt for the Public Works Facility and 3505 Hamilton Street (5 minutes)

HCC-125-FY19

Recommendation:

I move that the Mayor and Council adopt Hyattsville Ordinance 2018-08 authorizing the issuance of (1)(A) general obligation bonds and (B) general obligation bond anticipation notes, each in an original aggregate principal amount not exceeding Thirteen Million Eight Hundred Twenty-Five Thousand Dollars (\$13,825,000), and (2) general obligation refunding bonds, provided that the original aggregate principal amount of any series of refunding bonds shall not exceed one hundred thirty percent (130%) of the aggregate principal amount of the bonds refunded. The proceeds of the sale are to be used and applied for the public purpose of financing, reimbursing or refinancing costs (as defined in the ordinance) of the projects identified as Public Works Facility, 3505 Hamilton Street and Cost of Issuance. In accordance with applicable budgetary procedures or law the authorized bonds, bond anticipation notes and refunding bonds shall be sold at private sale, unless by resolution City Council provides for the sale of the obligations by another permissible manner. The full faith and credit and unlimited taxing power are pledged to the prompt payment of debt service on each series of the obligations. Details of any series of the obligations shall be determined or provided by resolution of the City Council (SECOND READING/ADOPTION).

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

[HO 2018-08_Bond Ordinance.docx](#)

Summary Background:

In fiscal years 2016 thru 2019 City Council approved Capital Budget appropriations of \$3.3 million to renovate the Public Works Facility and \$10,265,000 to renovate 3505 Hamilton Street for the Police Department for a total not to exceed for both projects of \$13,565,000. Funding for both projects is being provided from approved Capital Budget Funds and thru the Issuance and sale of General Obligation Bonds and/or General Obligation Bond Anticipated Notes plus issuance costs in an aggregate principal amount not to exceed Thirteen Million Eight Hundred Twenty-Five Thousand Dollars \$13,825,000. The proceeds of the sale are to be used and applied for the public purpose of financing, reimbursing or refinancing costs (as defined in the ordinance) of the projects identified as Public Works Facility and 3505 Hamilton Street together with related costs.

Next Steps:

A first reading was held on November 5. Adoption is scheduled for December 3 and then complete the bond issuance process with the City's Financial Advisor.

Fiscal Impact:

The FY18 General Obligation Bonds will increase debt service beginning in FY19.

City Administrator Comments:

See summary above.

Community Engagement:

The community will have an opportunity to ask questions during the required public hearing for issuance of the General Obligation Bonds.

Strategic Goals:

Goal 3 – Promote a Safe and Vibrant Community

Legal Review Required?

Pending

CITY OF HYATTSVILLE
ORDINANCE 2018-08

AN ORDINANCE AUTHORIZING AND EMPOWERING CITY OF HYATTSVILLE (THE "CITY") TO ISSUE AND SELL FROM TIME TO TIME, UPON ITS FULL FAITH AND CREDIT, ONE OR MORE SERIES OF (1)(A) GENERAL OBLIGATION BONDS AND (B) GENERAL OBLIGATION BOND ANTICIPATION NOTES, EACH IN AN ORIGINAL AGGREGATE PRINCIPAL AMOUNT NOT EXCEEDING THIRTEEN MILLION EIGHT HUNDRED TWENTY-FIVE THOUSAND DOLLARS (\$13,825,000), AND (2) GENERAL OBLIGATION REFUNDING BONDS, PROVIDED THAT THE ORIGINAL AGGREGATE PRINCIPAL AMOUNT OF ANY SERIES OF REFUNDING BONDS SHALL NOT EXCEED ONE HUNDRED THIRTY PERCENT (130%) OF THE AGGREGATE PRINCIPAL AMOUNT OF THE BONDS REFUNDED THEREFROM, THE PROCEEDS OF THE SALE THEREOF TO BE USED AND APPLIED FOR THE PUBLIC PURPOSE OF FINANCING, REIMBURSING OR REFINANCING COSTS (AS DEFINED IN THIS ORDINANCE) OF THE PROJECTS IDENTIFIED HEREIN AS PUBLIC WORKS FACILITY AND 3505 HAMILTON STREET, TOGETHER WITH RELATED COSTS; SPECIFYING THE MAXIMUM PRINCIPAL AMOUNT OF THE BONDS AND THE BOND ANTICIPATION NOTES PROVIDED FOR HEREIN TO BE ALLOCATED TO SUCH PROJECTS, SUBJECT TO REALLOCATION BY THE CITY IN ACCORDANCE WITH APPLICABLE BUDGETARY PROCEDURES OR LAW; DETERMINING THAT EACH SERIES OF THE AUTHORIZED BONDS, BOND ANTICIPATION NOTES AND REFUNDING BONDS (EACH, A "SERIES OF OBLIATIONS" OR "OBLIGATIONS") SHALL BE SOLD AT PRIVATE SALE, UNLESS BY RESOLUTION THE CITY COUNCIL OF THE CITY (THE "CITY COUNCIL") PROVIDES FOR THE SALE OF ANY SERIES OF OBLIGATIONS BY ANOTHER PERMISSIBLE MANNER; AUTHORIZING THE CITY COUNCIL TO DETERMINE OR PROVIDE BY RESOLUTION FOR VARIOUS MATTERS RELATING TO THE AUTHORIZATION, SALE, SECURITY, ISSUANCE, DELIVERY, PAYMENT, AND REDEMPTION OR PREPAYMENT OF AND FOR EACH SERIES OF OBLIGATIONS; PLEDGING THE CITY'S FULL FAITH AND CREDIT AND UNLIMITED TAXING POWER TO THE PROMPT PAYMENT OF DEBT SERVICE ON EACH SERIES OF OBLIGATIONS AND PROVIDING FOR THE IMPOSITION OF AD VALOREM TAXES SUFFICIENT FOR SUCH PURPOSES; PROVIDING THAT THE PRINCIPAL OF AND INTEREST ON THE OBLIGATIONS ALSO MAY BE PAID FROM ANY OTHER SOURCES OF REVENUE LAWFULLY AVAILABLE TO THE CITY FOR SUCH PURPOSE; PROVIDING THAT CERTAIN ACTIONS MAY BE TAKEN OR PROVIDED FOR BY RESOLUTION IN CONNECTION WITH THE REISSUANCE OF ANY OBLIGATIONS; PROVIDING THAT ANY OF THE BONDS, BOND ANTICIPATION NOTES OR REFUNDING BONDS AUTHORIZED HEREBY MAY BE CONSOLIDATED WITH ANY BONDS, BOND ANTICIPATION NOTES AND/OR REFUNDING BONDS AUTHORIZED BY THE CITY COUNCIL AND ISSUED AS A SINGLE SERIES OF

Underlining = material added to Ordinance following introduction

~~Strike through~~ = material stricken from Ordinance following introduction

1 **BONDS, BOND ANTICIPATION NOTES AND/OR REFUNDING BONDS, AS**
2 **APPLICABLE; AUTHORIZING, EMPOWERING AND DIRECTING OFFICIALS AND**
3 **EMPLOYEES OF THE CITY TO TAKE CERTAIN ACTIONS IN CONNECTION WITH**
4 **THE OBLIGATIONS; AUTHORIZING MODIFICATIONS OF THE OBLIGATIONS TO**
5 **BE MADE BY RESOLUTION UNLESS ANOTHER ACTION IS REQUIRED;**
6 **PROVIDING THAT THIS TITLE BE DEEMED A FAIR SUMMARY OF THIS**
7 **ORDINANCE FOR ALL PURPOSES; PROVIDING THAT THE PROVISIONS OF THIS**
8 **ORDINANCE SHALL BE LIBERALLY CONSTRUED; AND OTHERWISE**
9 **GENERALLY RELATING TO THE SALE, ISSUANCE, DELIVERY AND PAYMENT OF**
10 **AND FOR THE OBLIGATIONS.**

11 **RECITALS**
12

13 1. City of Hyattsville, a municipal corporation of the State of Maryland (the “City”)
14 and a municipality within the meaning of the Enabling Act, the Bond Anticipation Note Act and
15 the Refunding Act identified below, is authorized and empowered by Sections 19-301 to 19-309,
16 inclusive, of the Local Government Article of the Annotated Code of Maryland (previously
17 codified as Sections 31 to 37, inclusive, of Article 23A of the Annotated Code of Maryland), as
18 replaced, supplemented or amended (the “Enabling Act”), and Section C5-23A of the Charter of
19 the City of Hyattsville, as replaced, supplemented or amended (the “Charter”), to borrow money
20 for any proper public purpose and to evidence such borrowing by the issuance and sale of its
21 general obligation bonds.

22 2. The City has determined to undertake the public purpose projects identified in
23 Section 3 of this Ordinance.

24 3. The City has determined to authorize the issuance and sale from time to time of one
25 or more series of its general obligation bonds in order to finance, reimburse or refinance all or a
26 portion of the costs of any of the public purpose projects identified in Section 3 of this Ordinance.

27 4. The City has determined that each series of the general obligation bonds authorized
28 hereby shall be sold at private sale through a negotiated underwriting unless the financial advisor
29 to the City, the City Administrator of the City (the “City Administrator”) and the Treasurer of the
30 City (the “Treasurer”) recommend that it would be more advantageous to the City to sell any such
31 series by another permissible method and the City Council of the City (the “City Council”) makes
32 such a determination by resolution.

33 5. Prior to issuing any one or more series of the general obligation bonds authorized
34 hereby, the City may need to obtain interim financing in order to finance or reimburse applicable
35 project costs on a timely basis through the issuance and sale from time to time of general obligation
36 bond anticipation notes in one or more series pursuant to the authority of Sections 19-211 to 19-
37 223, inclusive, of the Local Government Article of the Annotated Code of Maryland (previously
38 codified as Section 12 of Article 31 of the Annotated Code of Maryland), as replaced,
39 supplemented or amended (the “Bond Anticipation Note Act”).

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6. Subsequent to the issuance of any general obligation bonds provided for herein, the City may desire to currently refund or advance refund all or a portion of such bonds through the issuance and sale from time to time of one or more series of its general obligation refunding bonds pursuant to the authority of Section 19-207 of the Local Government Article of the Annotated Code of Maryland (previously codified as Section 24 of Article 31 of the Annotated Code of Maryland), as replaced, supplemented or amended (the “Refunding Act”).

7. The City has determined to pledge its full faith and credit and unlimited taxing power to the prompt payment of the principal of and interest on the bonds, the bond anticipation notes and the refunding bonds authorized hereby.

8. The City has determined to issue any series of the bonds, the bond anticipation notes and the refunding bonds authorized hereby in accordance with the terms and conditions provided for in a resolution or resolutions to be adopted by the City Council pursuant to the authority of the Enabling Act, the Bond Anticipation Note Act, the Refunding Act, Section C5-23A of the Charter and this Ordinance, as applicable.

NOW THEREFORE, BE IT ORDAINED, by the City Council of the City of Hyattsville in regular session assembled:

SECTION 1. (a) That the Recitals to this Ordinance are deemed a substantive part of this Ordinance and are incorporated by reference herein. Capitalized terms used in the Sections of this Ordinance and not otherwise defined herein shall have the meanings given to such terms in the Recitals.

(b) References in this Ordinance to any official by title shall be deemed to refer (i) to any official authorized under the Charter, the code of ordinances of the City (the “City Code”) or other applicable law or authority to act in such titled official’s stead during the absence or disability of such titled official, (ii) to any person who has been elected, appointed or designated to fill such position in an acting or interim capacity under the Charter, the City Code or other applicable law or authority, (iii) to any person who serves in a “deputy”, “associate” or “assistant” capacity as such an official, provided that the applicable responsibilities, rights or duties referred to herein have been delegated to such deputy, associate or assistant in accordance with the Charter, the City Code or other applicable law or authority, and/or (iv) to the extent an identified official commonly uses another title not provided for in the Charter or the City Code, the official, however known, who is charged under the Charter, the City Code or other applicable law or authority with the applicable responsibilities, rights or duties referred to herein.

(c) References in this Ordinance to the “principal amount” of any of the Bonds, the BANs, the Refunding Bonds or the Obligations (each as defined herein) shall be construed to mean the par amount of such Bonds, BANs, Refunding Bonds or Obligations, as applicable.

SECTION 2. That pursuant to the authority of the Enabling Act, Section C5-23A of the Charter and any other applicable law, the City hereby determines to borrow money and incur

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indebtedness for the public purpose of financing, reimbursing or refinancing costs (as defined in Section 3(b) hereof) of the Projects identified in Section 3(b) hereof.

SECTION 3. (a) That to evidence the borrowing and indebtedness authorized in Section 2 of this Ordinance, the City, acting pursuant to the authority of the Enabling Act, Section C5-23A of the Charter and any other applicable law, hereby determines to issue and sell from time to time, in one or more series, upon its full faith and credit, its general obligation bonds in an original aggregate principal amount not to exceed Thirteen Million Eight Hundred Twenty-Five Thousand Dollars (\$13,825,000) (each, a “series of the Bonds” and, collectively, the “Bonds”). Any series of the Bonds may be issued as one or more bonds and any such bond may be issued in installment form and/or draw-down form.

(b) With respect to the projects listed below, the word “costs” as used in Section 2 hereof shall include, as applicable, costs of the following activities and expenses: land and right-of-way acquisition and development; site and utility improvements, including, without limitation, grading, landscaping, paving, sidewalk, curb, gutter, storm water, water, and sewer improvements, and related or similar activities and expenses; demolition, razing and removal and related or similar activities and expenses; acquisition, construction, expansion, reconstruction, replacement, renovation, rehabilitation, improvement, installation, furnishing and equipping activities and expenses, and related or similar activities and expenses; planning, design, engineering, architectural, feasibility, surveying, bidding, permitting, inspection, construction management, financial, legal and administrative activities and expenses, and related or similar activities and expenses; costs of issuance (which may include costs of bond insurance or other credit or liquidity enhancement); capitalized interest; and any such costs that may represent the City’s share or contribution to the financing, reimbursement or refinancing of costs of any such project (collectively, “Costs of the Projects”). The maximum original aggregate principal amount of the Bonds (or the BANs, as identified in Section 7 hereof) to be appropriated or applied to the Costs of the Projects (exclusive of any premium realized upon sale or investment earnings that may be applied for such purposes) shall be allocated among the following public purpose projects in the maximum principal amount set forth opposite each, except as otherwise herein provided:

	<u>Project Description</u>	<u>Maximum Principal Amount</u>
1	Public Works Facility (1)	\$ 3,300,000
2	3505 Hamilton Street (2)	10,265,000
3	Costs of Issuance	<u>260,000</u>
	TOTAL	<u>\$13,825,000</u>

(1) Sometimes referred to in City materials as the Department of Public Works Renovation Project.

(2) Sometimes referred to in City materials as Reuse of 3505 Hamilton Street.

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1 The projects identified in line items 1-3 above (including Costs of Issuance) are collectively
2 referred to herein as the "Projects". Except as indicated in the footnotes above, the Projects
3 described in line items 1-3 above are identified by the names used in the City's Capital
4 Improvements Plan. The City, without notice to or the consent of any registered owners of the
5 Bonds (or the registered owners of any of the BANs, as applicable), may reallocate the maximum
6 principal amount of the Bonds (and of any of the BANs, as applicable) (exclusive of any premium
7 realized upon sale or investment earnings that may be applied for such purposes) to be spent among
8 any of the Projects identified herein in compliance with applicable budgetary procedures or
9 applicable law. Further, it is the intention of the City that proceeds of the Bonds (or of any of the
10 BANs, as applicable) may be spent on any applicable Costs of the Projects, notwithstanding the
11 descriptive names for such Projects in the table above, including, without limitation, costs related
12 to changes in the scopes of and/or names of any of the Projects identified above effected through
13 applicable budgetary procedures or applicable law.

14 (c) In the event the City issues any series of the BANs pursuant to Section 7 of this
15 Ordinance, proceeds of the Bonds of any series in anticipation of which such BANs were issued
16 may also be applied to prepay or pay principal, premium and/or interest on such series of the BANs
17 in accordance with the provisions of the Bond Anticipation Note Act, and such application shall
18 be deemed the payment of Costs of the Projects for purposes of this Ordinance.

19 SECTION 4. That the proceeds of the Bonds shall be used and applied by the City
20 exclusively and solely for the public purposes described in Section 3 of this Ordinance, unless a
21 supplemental ordinance is enacted by the City to provide for the use and application of such
22 proceeds for some other proper public purpose authorized by the Enabling Act, the Charter or other
23 applicable law; provided that, no such supplemental ordinance shall be required if changes in the
24 scope of or name of any Project are otherwise made as contemplated in Section 3(b) of this
25 Ordinance.

26 SECTION 5. That pursuant to the authority of the Enabling Act, Section C5-23A of the
27 Charter and any other applicable law, the City hereby determines that it is in the best interests of
28 the City to sell each series of the Bonds at private sale through a negotiated underwriting due to
29 the anticipated size of any issue and the ability to time the market, negotiate terms and thereby
30 obtain a beneficial interest rate or rates and other beneficial terms. Notwithstanding the foregoing
31 sentence, the City Council by resolution may determine, based on the recommendation of the
32 financial advisor to the City, the City Administrator and the Treasurer, that it would be more
33 advantageous to the City to sell any series of the Bonds by another permissible method for the
34 reasons specified in such resolution.

35 SECTION 6. That pursuant to the authority of the Enabling Act, Section C5-23A of the
36 Charter, any other applicable law and this Ordinance, the City Council, prior to the sale, issuance
37 and delivery of each series of the Bonds, shall adopt a resolution or resolutions specifying,
38 prescribing, determining or providing for the determination of, providing for, approving, or
39 providing for the approval of, such matters, details, forms (including, without limitation, the form

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1 of the Bonds of such series), documents or procedures as may be required by the Enabling Act,
2 the Charter, any other applicable law or this Ordinance or as the City Council may deem
3 appropriate for the authorization, sale, security, issuance, delivery, payment or redemption or
4 prepayment of or for such series of the Bonds. Any such resolution may set forth, determine or
5 provide for the determination of, approve or provide for the approval of, among other matters, as
6 applicable, the designation of such series of the Bonds; the date of issuance of such series of the
7 Bonds; the original aggregate principal amount of such series of the Bonds; the denominations of
8 such series of the Bonds; the maturity or maturities of such series of the Bonds; the principal
9 installments (including, without limitation, serial maturities and/or mandatory sinking fund
10 installments) payable on such series of the Bonds; the rate or rates of interest, or the method of
11 determining the rate or rates of interest, payable on such series of the Bonds, which may be fixed
12 or variable; provisions for the payment of late fees, additional interest and/or penalties payable
13 with respect to such series of the Bonds and/or adjustments to interest rates in appropriate
14 circumstances; the purchase price payable for such series of the Bonds (within the limits of any
15 applicable law); provisions relating to the redemption or prepayment of such series of the Bonds
16 at the City's option or by mandatory sinking fund payments; provisions allowing the registered
17 owners such series of the Bonds to put or cause the redemption or prepayment of the Bonds of
18 such series at their option; the components of the Projects (and related maximum principal
19 amounts) on which the proceeds of such series of the Bonds shall be expended and provisions for
20 appropriation, disposal and investment of such proceeds; provisions for the application of
21 unexpended proceeds, any premium paid upon sale and/or investment earnings on such series of
22 the Bonds of such series, which may include, without limitation, on Costs of the Projects or on
23 debt service payable on such series of the Bonds, to the extent permitted by applicable law; matters
24 relating to the method of sale of such series of the Bonds; the selection of any bond registrar,
25 paying agent, investment bidding agent or other appropriate service providers in connection with
26 such series of the Bonds; certifications, representations, determinations, designations or elections
27 relating to the tax-exempt or taxable status of interest payable on such series of the Bonds; and all
28 other terms and conditions pursuant to which such series of the Bonds will be sold, issued and
29 delivered. Among other matters, the City Council, by resolution, may authorize, approve or
30 otherwise provide for (i) payment of any commitment fee or similar fee and any other costs
31 (including other parties' legal costs) payable in connection with any series of the Bonds and any
32 compensation payable to the purchaser(s) of such series of the Bonds in the event the City fails to
33 deliver such series of the Bonds, (ii) the obtaining of credit enhancement or liquidity enhancement
34 for any series of the Bonds (and the negotiation, approval, execution and delivery of any
35 agreements or documents relating thereto), and (iii) any other agreements, documents, instruments
36 or determinations necessary or desirable to enhance the marketability of or as security for any
37 series of the Bonds, including, without limitation, any ratings, any official statement or similar
38 disclosure document or any continuing disclosure undertaking required to satisfy the requirements
39 of Securities and Exchange Commission Rule 15c2-12. References to providing for
40 determinations or approvals or similar matters by resolution shall be construed to permit the City
41 Council to delegate to one or more officials the authority to make or provide on behalf of the City
42 any of the determinations, approvals or other decisions contemplated by this Section 6. Any
43 resolution may specify, prescribe, determine or provide for the determination of, provide for, or

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1 approve or provide for the approval of, the details required or authorized in this Section 6 for more
2 than one series of the Bonds.

3 SECTION 7. (a) That pursuant to the authority of the Bond Anticipation Note Act,
4 Section C5-23A of the Charter and any other applicable law, the City is hereby authorized and
5 empowered to issue and sell, upon its full faith and credit, its general obligation bond anticipation
6 notes in one or more series from time to time in an original aggregate principal amount not to exceed
7 Thirteen Million Eight Hundred Twenty-Five Thousand Dollars (\$13,825,000) (each a “series of
8 the BANs” and, collectively, the “BANs”), prior to and in anticipation of the sale of any series of
9 the Bonds, for the public purpose of financing or reimbursing Costs of the Projects on an interim
10 basis. Any such series of the BANs may consist of one or more notes and any note may be issued in
11 installment form and/or draw-down form. Prior to the sale, issuance and delivery of each series of
12 the BANs, the City Council shall adopt a resolution or resolutions pursuant to the authority of the
13 Bond Anticipation Note Act, the Charter, any other applicable law and this Ordinance authorizing
14 such series of the BANs and specifying, prescribing, determining or providing for the determination
15 of, providing for, approving, or providing for the approval of, with respect to such series of the BANs,
16 the same types of matters, details, forms, documents, procedures or determinations detailed in Section
17 6 hereof that may be made or addressed with respect to each series of the Bonds, to the extent
18 applicable with respect to such series of the BANs, and as otherwise may be authorized or required
19 by applicable law. Unless the City Council determines otherwise in a resolution providing for any
20 series of the BANs, pursuant to the authority of the Bond Anticipation Note Act, each series of the
21 BANs shall be sold by private negotiation. Any such sale by private negotiation is hereby determined
22 to be in the public interest due to the ability to time the market, negotiate with potential purchasers
23 and thereby achieve a beneficial interest rate or rates and other beneficial terms by undertaking a sale
24 by private negotiation and, with respect to a private sale that involves a direct purchase transaction,
25 the lower costs of issuance typically incurred with such a direct purchase transaction as compared to
26 a negotiated underwriting or a public sale at competitive bid. By resolution the City Council may
27 delegate to one or more City officials the authority to make any final determinations, approvals or
28 decisions with respect to a series of the BANs. Any resolution may specify, prescribe, determine or
29 provide for the determination of, provide for, or approve or provide for the approval of, the details
30 required or authorized by this Section 7 for more than one series of the BANs.

31 (b) The City hereby covenants (i) to pay from the proceeds of one or more series of the
32 Bonds the principal of any series of the BANs actually issued, (ii) to the extent that interest on any
33 series of the BANs is not paid from proceeds of the BANs, the interest on such series of the BANs,
34 and (iii) to issue the applicable series of the Bonds as soon as there is no longer a reason for deferring
35 its issuance. This covenant shall not be construed to prevent the City from paying principal of and/or
36 interest on any series of the BANs from sources of funds other than proceeds of the Bonds, to the
37 extent such other sources are available for such purpose.

38 (c) As authorized by the Bond Anticipation Note Act, by resolution the City Council may
39 provide for the renewal of any series of the BANs at maturity with or without resale, together with
40 any amendments or modifications to such series of the BANs and any related documentation.

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1 SECTION 8. That pursuant to the authority of the Enabling Act, the Refunding Act,
2 Section C5-23A of the Charter and any other applicable law, the City is hereby authorized and
3 empowered to issue and sell from time to time, in one or more series, upon its full faith and credit,
4 its general obligation bonds (each, a “series of the Refunding Bonds” and, collectively, the
5 “Refunding Bonds”) for the purpose of currently refunding or advance refunding in whole or in
6 part any of the Bonds then outstanding, including paying all or any portion of the following:
7 outstanding principal, any redemption or prepayment premium, and/or interest accrued or to accrue
8 to the date or dates of redemption, prepayment, purchase or maturity of the Bonds to be refunded,
9 costs and expenses incurred in connection with the sale, issuance and delivery of such Refunding
10 Bonds, and, to the extent determined by the City Council by resolution, interest on such Refunding
11 Bonds, for the public purpose of (A) realizing savings in the total cost of debt service on a direct
12 comparison or present value basis, or (B) debt restructuring that reduces the total cost of debt service
13 or is determined by the City Council to be in the best interests of the City, to be consistent with the
14 City’s long-term financial plan, and to realize a financial objective of the City, including improving
15 the relationship of debt service to any source of payment such as taxes, assessments or other charges,
16 or for any other purpose then authorized by the Refunding Act or other applicable law, and as to be
17 determined by resolution of the City Council; provided that, the original aggregate principal amount
18 of any such series of the Refunding Bonds shall not exceed one hundred thirty percent (130%) of
19 the outstanding aggregate principal amount of the Bonds refunded therefrom. Any such series of
20 the Refunding Bonds may consist of one or more bonds and any such bond may be issued in
21 installment form and/or draw-down form. Prior to the sale, issuance and delivery of each series of
22 the Refunding Bonds, the City Council shall adopt a resolution or resolutions pursuant to the authority
23 of the Refunding Act, the Charter, any other applicable law and this Ordinance authorizing such series
24 of the Refunding Bonds and specifying, prescribing, determining or providing for the determination
25 of, providing for, approving, or providing for the approval of, with respect to such series of the
26 Refunding Bonds, the same types of matters, details, forms, documents, procedures or determinations
27 detailed in Section 6 above that may be made or addressed with respect to each series of the Bonds,
28 to the extent applicable with respect to such series of the Refunding Bonds, and as otherwise may be
29 authorized or required by applicable law, including, without limitation, the purposes of the
30 Refunding Act to be achieved by the issuance of such series of the Refunding Bonds, the selection
31 of any escrow agent or verification consultant, the selection of any escrow bidding agent, the
32 determination of the Bonds to be refunded in whole or in part from such series of the Refunding
33 Bonds, and any agreements, documents or other instruments necessary or desirable in connection
34 with the refunding. Unless the City Council determines otherwise in a resolution providing for
35 any series of the Refunding Bonds, pursuant to the authority of the Refunding Act, each series of
36 the Refunding Bonds shall be sold at a private sale, without soliciting bids. Any such sale at a
37 private sale, without soliciting bids, is hereby determined to be in the public interest due to the ability
38 to time the market, negotiate with potential purchasers and thereby achieve a beneficial interest rate
39 or rates and other beneficial terms by undertaking a private sale and, with respect to a private sale that
40 involves a direct purchase transaction, the lower costs of issuance typically incurred with such a direct
41 purchase transaction as compared to a negotiated underwriting or a public sale at competitive bid. By
42 resolution the City Council may delegate to one or more City officials the authority to make any final
43 determinations, approvals or decisions with respect to a series of the Refunding Bonds. Any

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1 resolution may specify, prescribe, determine or provide for the determination of, provide for, or
2 approve or provide for the approval of, the details required or authorized by this Section 8 for more
3 than one series of the Refunding Bonds.

4 SECTION 9. (a) That the full faith and credit and unlimited taxing power of the City
5 are hereby pledged to the prompt payment of the principal of and interest on each series of the
6 Bonds, the BANs or the Refunding Bonds, as applicable (collectively, the "Obligations"), when
7 due and to the imposition of the taxes hereinbelow described as and when such taxes may become
8 necessary in order to provide sufficient funds to meet the debt service requirements of each series
9 of the Obligations. Subject to the further provisions of this Section 9, the City hereby covenants
10 with the registered owners of the Obligations of each series to impose ad valorem taxes on all real
11 and tangible personal property in the City that is subject to assessment for unlimited municipal
12 taxation at a rate and in an amount sufficient to pay the principal of and the interest on the
13 Obligations in each fiscal year in which any of the Obligations are outstanding and to take any
14 further action that may be lawfully appropriate from time to time during the period that the
15 Obligations of such series remain outstanding and unpaid to provide the funds necessary to pay
16 promptly the principal thereof and the interest due thereon. If the proceeds from the taxes so levied
17 in any such fiscal year are inadequate for such payment, additional taxes shall be levied in the
18 succeeding fiscal year to make up such deficiency.

19 (b) The foregoing provisions shall not be construed so as to prohibit the City from
20 paying the principal of and interest on the Obligations of any series from the proceeds of the sale
21 of any other obligations of the City or from any other funds legally available for that purpose
22 (including, without limitation, with respect to any BANs, from the proceeds of any Bonds and,
23 with respect to any Bonds, from the proceeds of any Refunding Bonds). Within the limitations of
24 any applicable Maryland or federal law (including, without limitation, the Internal Revenue Code
25 of 1986, as amended, and the regulations issued thereunder), the City may apply to the payment
26 of the principal of or interest on the Obligations of any series any funds received by it from the
27 State of Maryland or the United States of America, or any governmental agency or instrumentality,
28 or from any other source, if the funds are granted or paid to the City for the purpose of assisting
29 the City in accomplishing the types of projects which the Obligations of such series are issued to
30 finance, reimburse or refinance or are otherwise available for such purpose, and to the extent of
31 any such funds received or receivable in any fiscal year, the taxes hereby required to be imposed
32 may be reduced proportionately.

33 (c) By resolution, the City Council may provide that all or a portion of the principal of
34 and interest on any series of the Obligations may be payable in the first instance from any other
35 source or sources designated in such resolution, to the extent such moneys are available for such
36 purpose.

37 SECTION 10. That by resolution, the City Council may make any appropriate arrangements
38 (including, without limitation, by authorizing one or more appropriate officials to make any elections,
39 designations, determinations or filings on the City's behalf) in the event any right of the registered

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owner of an Obligation to put or cause the prepayment or redemption of such Obligation at its option, or any change in the interest rate of an Obligation, or any other modification to an Obligation could lead to a reissuance of such Obligation for purposes of the Internal Revenue Code of 1986, as amended, and the regulations issued thereunder.

SECTION 11. That by resolution the City Council may determine that any of the Bonds, the BANs or the Refunding Bonds may be consolidated with any other bonds, bond anticipation notes and/or refunding bonds authorized by the City Council and issued as a single series of bonds, bond anticipation notes and/or refunding bonds, as applicable.

SECTION 12. That by resolution the City Council may make or authorize any modifications to (i) any series of the Obligations once issued, and (ii) any related documentation, certificates or instruments, unless under applicable law the proposed modifications require action by ordinance in addition to or in place of a resolution.

SECTION 13. That the Mayor of the City, the City Administrator, the Treasurer, the City Clerk of the City, as appropriate, and all other appropriate officials and employees of the City are hereby authorized, empowered and directed to (i) take any and all action necessary to complete and close the sale, issuance and delivery of the Bonds, the BANs and the Refunding Bonds, (ii) negotiate, approve, execute and deliver all documents, certificates and instruments necessary or appropriate in connection with any such sale, issuance and delivery, and (iii) carry out the transactions contemplated by this Ordinance, any resolution adopted in furtherance of this Ordinance, and any documents, certificates or instruments executed and delivered in connection with any series of the Obligations.

SECTION 14. That the title of this Ordinance shall be deemed to be, and is, a fair summary of this Ordinance for publication and all other purposes.

SECTION 15. That the provisions of this Ordinance shall be liberally construed in order to effectuate the transactions contemplated by this Ordinance.

SECTION 16. That this Ordinance shall become effective twenty (20) calendar days following the date of its passage, subject to the provisions of Section C2-10(A) of the Charter regarding the filing with the City Clerk of a valid petition for referendum within thirty (30) business days following the passage of this Ordinance.

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1 **INTRODUCED** by the Mayor and City Council of the City of Hyattsville, Maryland at a
2 regular public meeting on November 5, 2018, at which meeting copies were available to the public
3 for inspection.
4

5 **PASSED** _____ [as introduced] _____ [as amended] by the Mayor and City
6 Council of the City of Hyattsville, Maryland at a __x__ regular ____ special [check applicable
7 meeting type] public meeting on December 3, 2018, at which meeting copies were available to the
8 public for inspection.
9

10
11 ATTEST:
12
13
14
15

16 _____
17 Laura Reams, City Clerk
18

16 _____
17 Candace B. Hollingsworth, Mayor
18

19
20 #206299;50036.017

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Hyattsville City Council Agenda Item Report

Meeting Date: December 3, 2018

Submitted by: Katie Gerbes

Submitting Department: Community & Economic Development

Item Type: Planning & Development

Agenda Section: Action Items (8:45 p.m. - 9:20 p.m.)

SUBJECT

Hyattsville Transportation Study (20 minutes)

HCC-163-FY19

Recommendation:

I move that the City Council adopt the 2018 Hyattsville Transportation Study, the study shall serve as the City's transportation policy and action plan, guiding the City of Hyattsville's prioritization of transportation infrastructure investment.

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

N/A

ATTACHMENTS

[Transportation Study Adoption Memo 1.docx](#)

[Final Report HVL_112918.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 164

the report, the City Council was presented with the list of comments collected by residents and staff during the October review period for discussion at the November Council meetings.

The adopted Hyattsville Transportation Study will serve as the City's transportation policy and action plan for the foreseeable future. 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:

For review

Community Engagement:

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 27, 2018

Re: Hyattsville Transportation Study – Final Report

Attachments: Hyattsville Transportation Study – Updated November 2018
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 November 5 Comments

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 November 5 meeting, the Council directed staff to perform further analysis on nine different recommendations in the plan, or recommendations submitted by residents. That analysis was provided to the City Council for discussion on November 19. At that meeting, the Council provided Staff feedback on many of the nine recommendations, but left two recommendations to discuss at the December 3 meeting:

- BB-5: Designate and design a bike boulevard on Oglethorpe Street to improve east-west connectivity;
- NS-1: Study alternative routes for a new street connection from Toledo Terrace to Heurich Park Road

Staff request that the City Council make a determination on the inclusion and/or removal of the remaining two recommendations at the December 3 meeting.

Next Steps

The Hyattsville Transportation Study is on the "Action" agenda for the December 3, 2018 City Council meeting. At this meeting, Staff will be seeking direction from the City Council on any final edits that should be incorporated into the study. 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.



Hyattsville Transportation Study

Final Report

November 29, 2018

Prepared by:

TOOLE
DESIGN

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- Appendix C: Wayfinding Report
- Appendix D: Planning-Level Cost Estimate

I. Executive Summary

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 nine 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 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.
- Strategy 9: Review parking policy and adopt new regulations.

These strategies informed the development of 66 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.

2. Introduction

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.

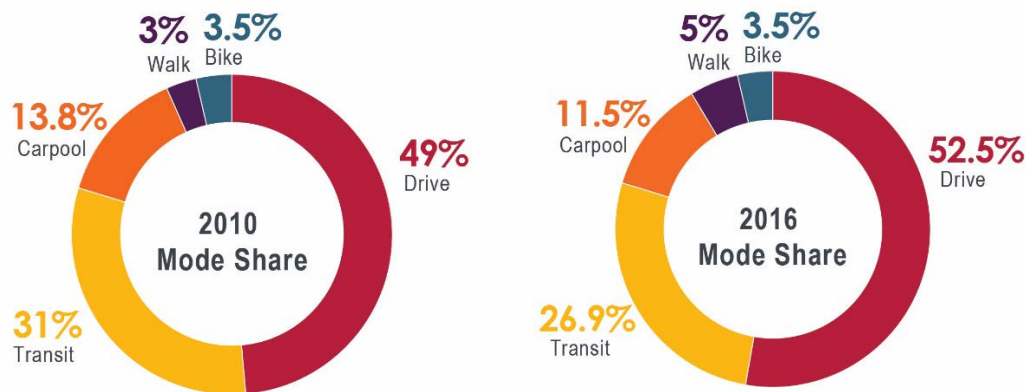
Population Growth

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 Exhibit I, between 2010 and 2017, motor traffic volumes decreased on Queens Chapel Road (MD 500) and Hamilton Street/38th Street (MD 208), while it increased on East-West Highway (MD 410), Route 1 (US 1), and Route 1 Alternate (US 1 ALT), 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.

Exhibit I: Average Annual Daily Traffic (AADT) Changes on Major Streets in Hyattsville

Road	Location	2010 AADT	2017 AADT	% 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 (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.

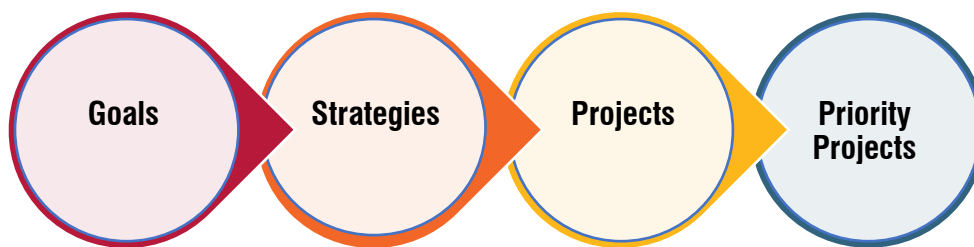
Study Approach

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 strategies that will guide the City as it further develops 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 roads within City limits. In the context of this Study, these strategies 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

City History

Since its founding, transportation has shaped Hyattsville's development patterns. During the 19th 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 20th 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 14th-largest municipality in the State of Maryland, and the 5th largest municipality in Prince George's County in terms of population. However, in terms of population and employment density, Hyattsville is the 2nd 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.

Exhibit 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
Hyattsville	18,262	8,482	2.67	6840	3177	2
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 38th Street
- Jefferson Street between 40th Avenue and Baltimore Avenue
- 38th Street between Hamilton Street and Northwest Branch Trail
- 40th Avenue and 41st 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.

4. Major Transportation Findings

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.

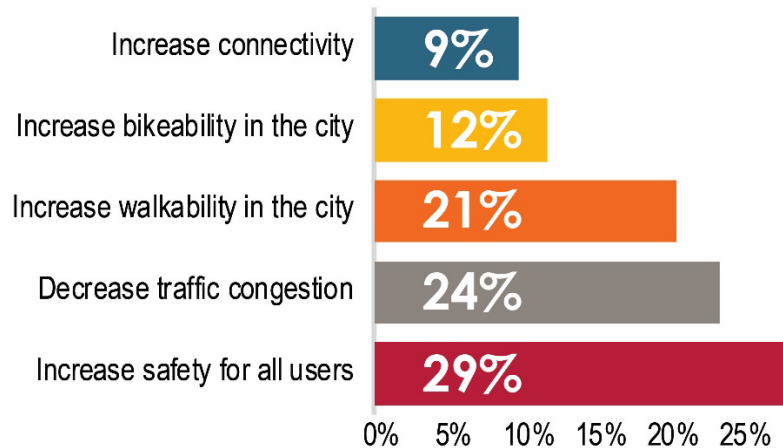
A major effort of this Study was to solicit input from the public to ensure that their concerns are addressed. Two series of public meetings were held during the project. The first set of meetings were held at the beginning of the project and allowed residents to set the direction of the Study. The major input of the first public meetings 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. In addition to a City-wide meeting, meetings were held in each ward to focus on ward-specific issues.



Participants at the first public meeting

The second set of public meetings were held to present the draft findings and recommendations of the Study. These meetings allowed residents to provide comments on the draft recommendations so that the City can address them before it is finalized. 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, 38th Avenue, 41st Avenue, and 42nd 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 41st Avenue, 42nd 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 40th 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)
- 42nd Avenue (Oglethorpe Street to East-West Highway)
- Hamilton Street (Queens Chapel Road to 38th Street)
- 38th 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
- 42nd 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.

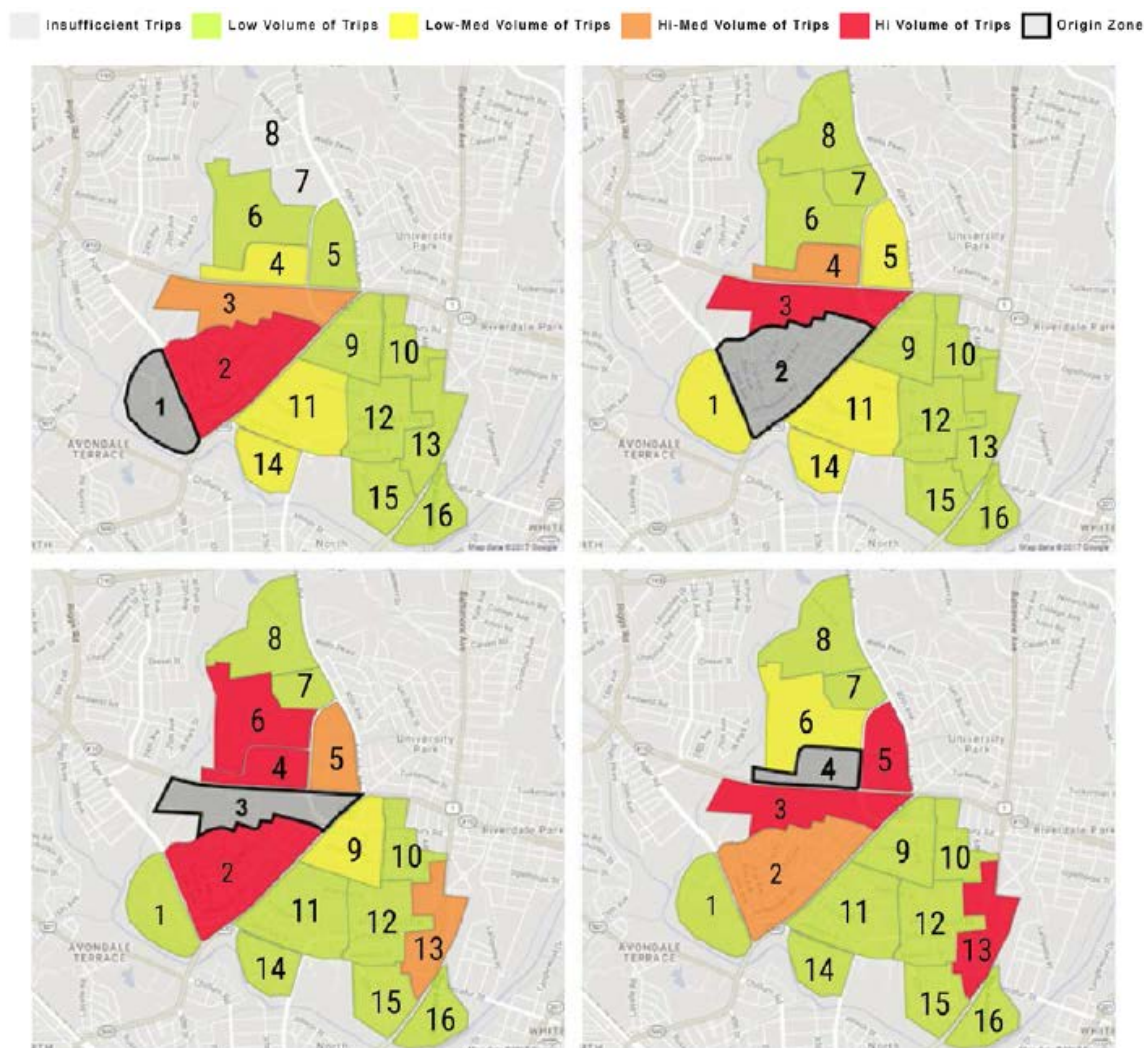
This travel pattern indicates a demand for a more direct connection between these two zones, which could have the additional benefit of reducing local traffic on Queens Chapel and East-West Highway. While a direct roadway connection may not be desirable, a high-quality bicycle and pedestrian connection 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).

Exhibit 3: 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 36th Avenue to 36th Place
- Jamestown Road, from Manorwood Drive to Lancer Drive
- Oglethorpe Street, from 41st Avenue to 42nd Avenue
- 42nd 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 38th Place to 39th Avenue
- Oglethorpe Street from 41st Avenue to 42nd Avenue
- 42nd 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 42nd Avenue (adjacent to the middle school) and on 42nd 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.

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



Existing Wayfinding Signs

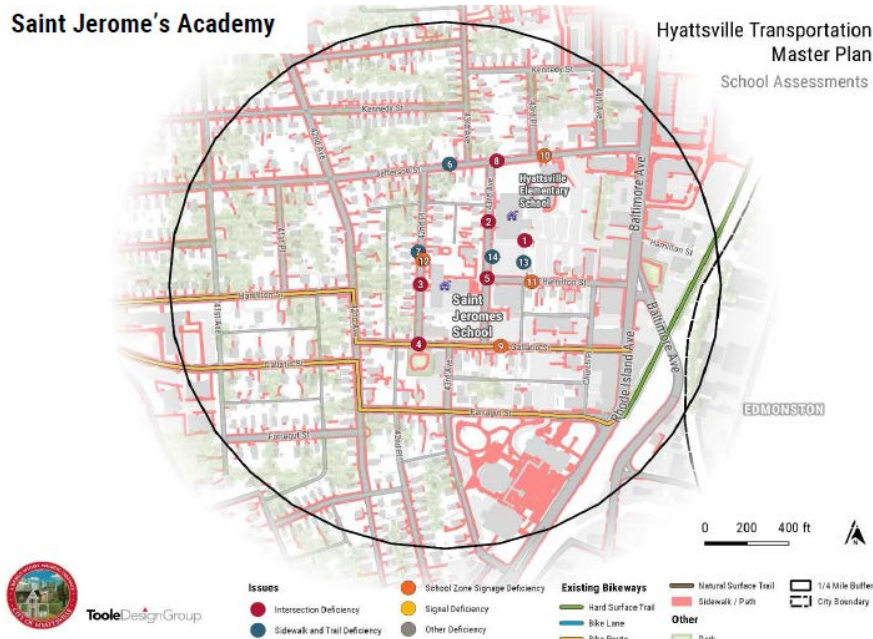
design and condition of existing wayfinding signs for both motorized and non-motorized mode of transportation. It also recommends new wayfinding sign design that builds on the streetcar history of Hyattsville and provides a consistent design for different types of signs.

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.

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. Exhibit 4 shows the example of the school assessment for Saint Jerome’s Academy.

Exhibit 4: School Area Deficiencies for Saint Jerome's Academy (See Appendix A for other school assessments)

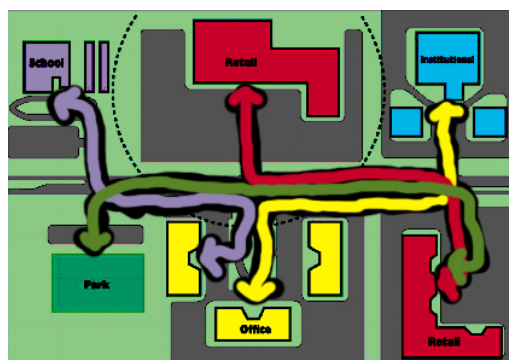


5. Future Transportation Needs

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

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.

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.

Analysis for this Study used the Metropolitan Washington Council of Governments (MWCOC) 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

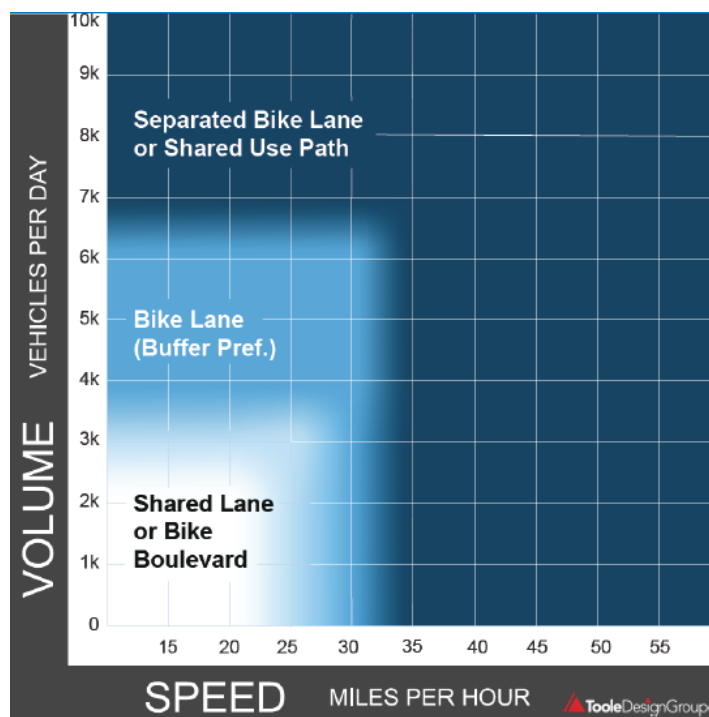
the proximity of these local destinations. More people may work, shop, go to school, or participate in leisure activities close to home, or make greater use of the City's public transportation assets. To reduce reliance on single-occupancy vehicle for travel, especially for short trip lengths around 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.

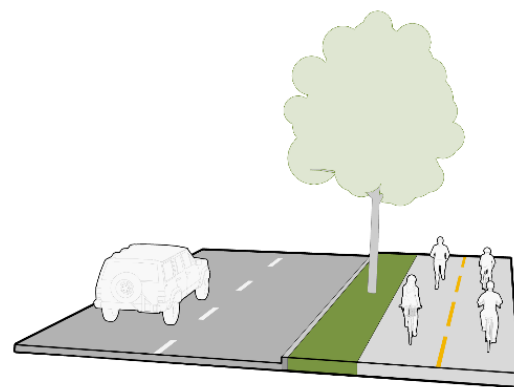
Below is a chart from the forthcoming AASHTO (American Association of State Highway and Transportation Officials) Guide for the Design of Bicycle Facilities, which provides general guidelines for designing bicycle facilities based on the roadway's speed and traffic volume. On slower streets with little 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.

Exhibit 5: Bicycle Facility Selection Chart



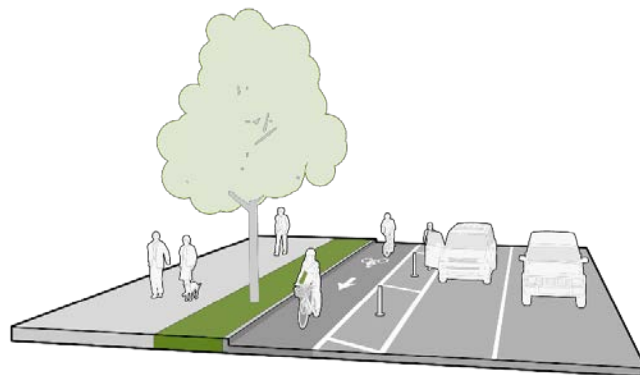
Multiuse Paths

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

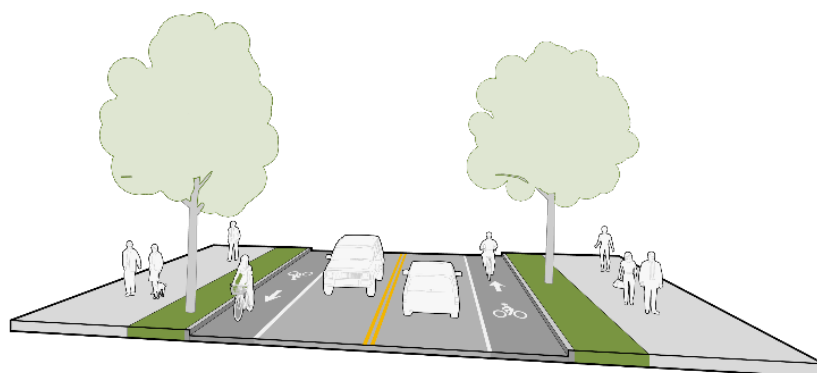
Separated Bicycle Lanes (SBLs) are on-street bicycle lanes that are physically separated from motor vehicle traffic. SBLs can be designed for one-way or two-way bicycle traffic. Additionally, they can be level with the travel lane, raised but still lower than the sidewalk, or level with the sidewalk. 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 Exhibit 7. Hyattsville should use this guideline to install safe pedestrian crossings at unsafe locations with high pedestrian crossing demand.

Exhibit 7: 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 5 6	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7
3 lanes with raised median*	1 2 3 4 5	1 3 5 7	1 3 5 7	1 3 4 5 7	1 3 5 7	1 3 5 7	1 3 4 5 7	1 3 5 7	1 3 5 7
3 lanes w/o raised median†	1 2 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7
4+ lanes with raised median†	1 3 5	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7
4+ lanes w/o raised median†	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 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,

- 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

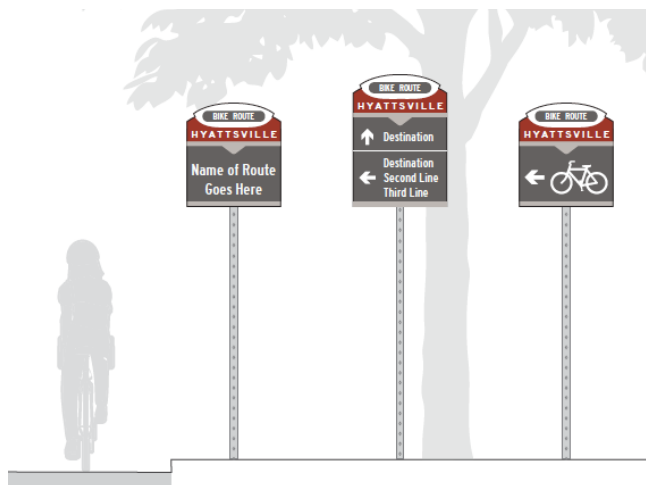
Hyattsville is served relatively well by regional transit service, including two Metro stations, Metrobus, The Bus, and UMD shuttle. However, the big data analysis as well as public input revealed that there is significant demand for travel between Hyattsville Crossing, the Gateway Arts District, and 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.

Exhibit 8: Proposed Wayfinding Sign Design



Bicycle Wayfinding Signs



Kiosk Sign



Vehicular Wayfinding



Sign Detail Example

6. Proposed Transportation Network

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.

- 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 other measures to reduce cut through traffic.
- **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 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.
- **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 33rd 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:
 - o Oliver Street between 42nd Place and 43rd Avenue
 - o 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.

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 38th Avenue between from Hamilton Street to Northwest Branch Trail
 - Along 41st 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 42nd Avenue and 42nd 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 34th Avenue (upgrade existing path to accessible standards)
 - Between Nicholas Orem Middle School and the intersection of 35th Avenue and Oliver Street
 - Between First Baptist Church and the intersection of 42nd 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
- **Project: Install crosswalk on the northern leg of the intersection of Baltimore Avenue and Jefferson Street.** The intersection of Baltimore Avenue and Jefferson Street in front of the Arts District Hyattsville shopping center is one of the most frequented intersections by pedestrians. Currently, east/west crossing is only feasible on the southern leg of the intersection. The City should advocate for SHA to install a crosswalk at the northern leg of the intersection to further improve pedestrian connectivity.

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. As with all traffic circulation changes, care should be given to minimize and accommodate parking impacts. The City should change traffic circulation on the following streets:
 - Hamilton Street – convert to two-way from Route 1 to 43rd Ave
 - Hamilton Street – convert to two-way from 40th Avenue to 42nd Avenue
 - Farragut Street – convert to two-way from 42nd Avenue to access to the Prince George's County Services Complex.
 - Jefferson Street – convert to two-way or reverse one-way from 35th Avenue to Queens Chapel Road
 - Oglethorpe Street – convert to two-way from 42nd Place to 44th Avenue
 - Jamestown Road – convert to two-way from 31st 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:

- o Jamestown Road between Ager Road and Oliver Street
 - o Jefferson Street between 40th Avenue and Baltimore Avenue
 - o Nicholson Street between Ager Road and Queens Chapel Road
 - o Oglethorpe Street between Queens Chapel Road and Baltimore Avenue
 - o 40th Avenue between Hamilton Street and 41st Avenue
 - o 41st Avenue between 40th 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 23rd Avenue to Adelphi Road.
- **Project: Install multi-use path connecting Calverton Drive and Dean Drive.** Currently Calverton Drive and Dean Drive are dead-end streets that limit accessibility into the University Hills neighborhood. To be consistent with the Prince George's Plaza Transit District Development Plan, a multi-use path should be installed to connect these two streets and thereby improve connectivity and access between the University Hills

neighborhood and amenities in the Prince George's Plaza area, such as the Metro Station and the Mall at Prince George's.

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:

- o Editors Park Drive between East-West Highway and Toledo Terrace
 - o Freedom Way between Toledo Terrace and Belcrest Road
 - o America Boulevard between East-West Highway and Queens Chapel Road
 - o 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.

Strategy 9: Review Parking Policy and Adopt New Regulations.

- **Project: 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).
- **Project: 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.
- **Project: 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.

- **Project: 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 42nd 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.
- **Project: 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.
- **Project: 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.
- **Project: 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.

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 in Exhibit 10.

Exhibit 9: Project Recommendations

Project ID	Category	Project Name	Description	Relevant Strategy
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	5
BB-2	Bike boulevard	Nicholson Street Bike Blvd (Ager Rd to 40 th Avenue)	Designate and design as bike boulevard to improve east-west bicycle connectivity	5
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	5
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	5
BB-5	Bike boulevard	Oglethorpe Street Bike Blvd	Designate and design as bike boulevard to improve east-west bicycle connectivity	5
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	8
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	8
CC-1	Circulation change	Hamilton Street two-way conversion at Route 1	Convert to two-way from 43 rd Ave to Route 1	4
CC-2	Circulation change	Hamilton Street two-way conversion at 42 nd Avenue	Convert to two-way from 40 th Avenue to 42 nd Avenue	4
CC-3	Circulation change	Farragut Street two-way conversion	Convert to two-way from 42 nd Avenue to access the Prince George's County Services Complex	4
CC-4	Circulation change	Jefferson Street two-way or reversal	Convert to two-way or reverse the one-way from 35 th Avenue to Queens Chapel Road	4
CC-5	Circulation change	Oglethorpe Street two-way conversion	Convert to two-way from 42 nd Place to 44 th Avenue	4

Project ID	Category	Project Name	Description	Relevant Strategy
CC-6	Circulation change	Jamestown Road two-way conversion	Convert to two-way from 31 st Avenue to Lancer Drive	4
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	6
I-2	Intersection	40th Avenue, Gallatin Street, & Hamilton St. Roundabout	Install roundabout to improve traffic flow, safety, and gateway treatment to City's core	6
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	6
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	6
I-5	Intersection	East-West Highway & Belcrest Road improvement	Consider reconfiguring to exclusive dual NBLT and single SBLT lanes to improve vehicular operation	6
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	6
I-7	Intersection	East-West Highway & Route 1 Improvement	Consider providing dual westbound left-turn lanes	6
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	6
I-9	Intersection	Route 1 and Farragut Street Reconfiguration	Consider consolidating two eastbound lanes to one to reduce pedestrian crossing distance.	6
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	6
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	5
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	5
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	5

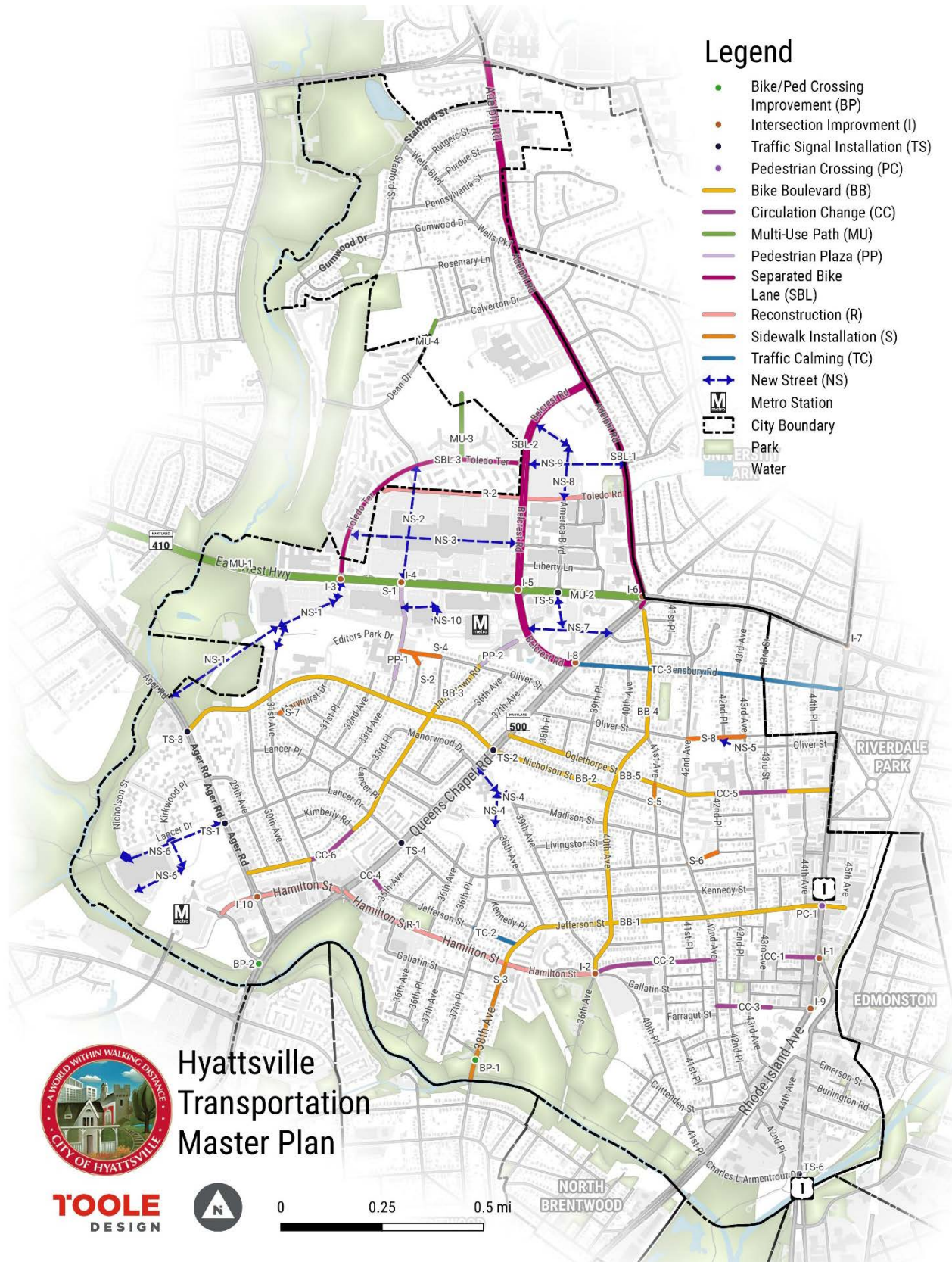
Project ID	Category	Project Name	Description	Relevant Strategy
MU-4	Multiuse path	Calverton Drive to Dean Drive	Construct multiuse path between Calverton Drive and Dean Drive	5
NS-1	New street	Toledo Terrace to Heurich Park Road Connection	Study alternative routes for the new street connection to improve local 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	1
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	7
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	7
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	1
NS-5	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	1
NS-6	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	7
NS-7	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	7
NS-8	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	7
NS-9	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	7
NS-10	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	7
P-1	Parking	Parking Policy Revision	Review City Parking Policies and Adopt New Regulations	9
PC-1	Pedestrian crossings	Crosswalk at Jefferson Street and Baltimore Avenue	Install a crosswalk at the northern leg of the intersection of Baltimore Avenue with Jefferson Street	3
PC-2	Pedestrian crossings	Citywide pedestrian improvements	Install curb extensions, high-visibility crosswalks, Rectangular Rapid Flashing Beacon (RRFB), pedestrian hybrid beacons, where appropriate	1

Project ID	Category	Project Name	Description	Relevant Strategy
PP-1	Pedestrian plaza	33rd Avenue to Editors Park Drive Plaza	Construct public plaza connection between 33rd Avenue and East-West Highway	1
PP-2	Pedestrian plaza	McClanahan Park	Construct plaza/wider sidewalk/trail from Jamestown Rd to Prince George's Plaza Metro station at McClanahan Park	1
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	5
SBL-2	Separated bike lanes	Belcrest Road Separated Bike Lanes	Install Separated Bike Lanes (or multiuse path) from Adelphi Rd to Queens Chapel Rd)	5
SBL-3	Separated bike lanes	Toledo Terrace Separated Bike Lanes	Install Separated Bike Lanes from Belcrest Rd to EW Highway	5
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	2
R-2	Reconstruction	Toledo Road Complete Street Design and Construction	Design and build Complete Street from Adelphi Road to Toledo Place	2
S-1	Sidewalk installation	East-West Highway to mall at Editors Park Drive	Work with developer to create accessible entrance to mall	3
S-2	Sidewalk installation	34th Avenue to Middle School Ped Connection	Install accessible pathway connecting Nicholas Orem Middle School to 34th Avenue	3
S-3	Sidewalk installation	38th Avenue Sidewalk from Hamilton Street to Northwest Branch Trail	Install missing sidewalk (could require additional ROW on either side)	3
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	3
S-5	Sidewalk installation	41st Avenue Sidewalk from Nicholson Street to Oglethorpe Street	Construct new sidewalk	3
S-6	Sidewalk installation	42nd Place to 42nd Ave Ped Connection near Macaroy Street	Consider building pathway connecting 42nd Place to First Baptist Church	3
S-7	Sidewalk installation	Maryhurst Drive Sidewalk installation	Install new sidewalk on the south side of Maryhurst Drive	3
S-8	Sidewalk installation	Oliver Street Sidewalk between 42nd Avenue and 43rd Avenue	Construct sidewalk within the existing ROW	3
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	3

Project ID	Category	Project Name	Description	Relevant Strategy
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	3
TC-2	Traffic calming	3700 Block of Jefferson Street Traffic Calming	Install curb extension on the NW corner of 38 th St/ Jefferson St intersection and other measures to discourage cut-through traffic	3
TC-3	Traffic calming	Queensbury Road Traffic Calming	Install traffic calming devices to discourage cut-through traffic	3
TS-1	Traffic signal	Ager Road and Lancer Drive Traffic signal	Install traffic signal to improve operation and safety for all users	6
TS-2	Traffic signal	Queens Chapel Road and Nicholson Street Traffic Signal	Install traffic signal to improve operation and safety for all users	6
TS-3	Traffic signal	Ager Road and Nicholson Street Traffic Signal	Conduct signal warrant analysis and improve pedestrian safety	6
TS-4	Traffic signal	Queens Chapel Road and Lancer Drive Traffic Signal	Install traffic signal to improve operation and safety for all users	6
TS-5	Traffic signal	East-West Highway and America Boulevard Traffic Signal	Potential future signal as part of area redevelopment	6
TS-6	Traffic signal	Route 1 Alternate and Armentrout Drive Traffic Signal	Install traffic signal to improve operation and safety for all users	6
WF-1	Wayfinding	Wayfinding Overhaul	Install new wayfinding signs on bicycle boulevards and major destinations	5

EB: Eastbound; WB: Westbound; NB: Northbound; SB: Southbound; LT: Left-Turn; RT: Right-Turn; TH: Through

Exhibit 10: Map of Recommended Projects



7. Implementation

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.

Exhibit 11: Top 20 Scored Projects

Project ID	Category	Project Name	Speak Up HVL: 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	3700 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 Exhibit 10. 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, Exhibit 12, 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.

Exhibit 12: 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	Hamilton Street two-way conversion at Route 1
	CC-2	Circulation Change	Hamilton Street two-way conversion at 42 nd Avenue
	CC-3	Circulation Change	Farragut Street two-way conversion
	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-6	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
	CC-4	Circulation change	Jefferson Street two-way or reversal
9	TC-1	Traffic Calming	Revamp the traffic calming program
	TC-2	Traffic Calming	3700 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
	CC-6	Circulation change	Jamestown Road two-way conversion
	S-7	Sidewalk installation	Maryhurst Drive 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
	CC-5	Circulation change	Oglethorpe Street two-way conversion
	PC-1	Pedestrian crossings	Crosswalk at Jefferson Street and Baltimore Avenue
	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-9	New street	Toledo Terrace extension between Belcrest Road and Adelphi Road
	NS-8	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-7	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	38th Street extension from current terminus to Queens Chapel Rd & Manorwood Dr.
	NS-5	New street	Oliver Street extension from 43rd Avenue to 42nd Place
18	MU-3	Multiuse Path	Northwestern High School Multiuse Trail Connection
	MU-4	Multiuse Path	Calverton Drive to Dean Drive multiuse path
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 Exhibit I I, 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 Exhibit 8 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

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 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. These strategies were used to create a list of 66 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:
TooleDesignGroup

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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.¹ 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).

¹WMATA 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)

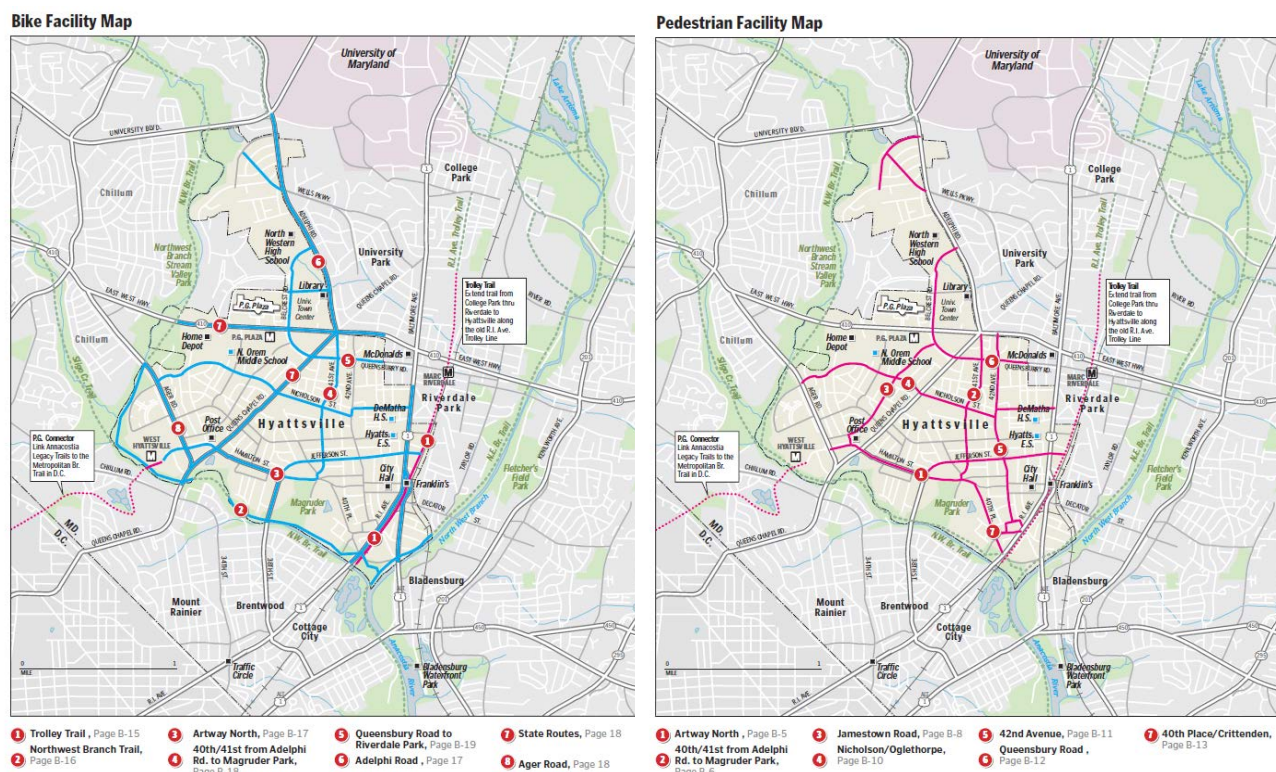
- o Adelphi Rd between Belcrest Road and Wells Parkway (Northwestern High School.
 - o Ager Road at Nicholson (West Hyattsville Elementary)
- Install new bicycle/pedestrian actuators:
 - o MD 208/ 38th Street south of Gaines Alley
 - o MD 500/ Queens Chapel south of Jamestown Road
- Install new sidewalks along 38th Avenue and Hamilton Street
- Work with WMATA to upgrade high-volume bus stops on Hamilton and 38th 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:

- 38th Avenue sidewalk installation (Hamilton to Northwest Branch Trail)
- 41st Avenue Intersection with Queensbury
- Artway North pedestrian and bicycle improvements
- 40th and 41st 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/ 38th 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/ 38th 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 35th 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:

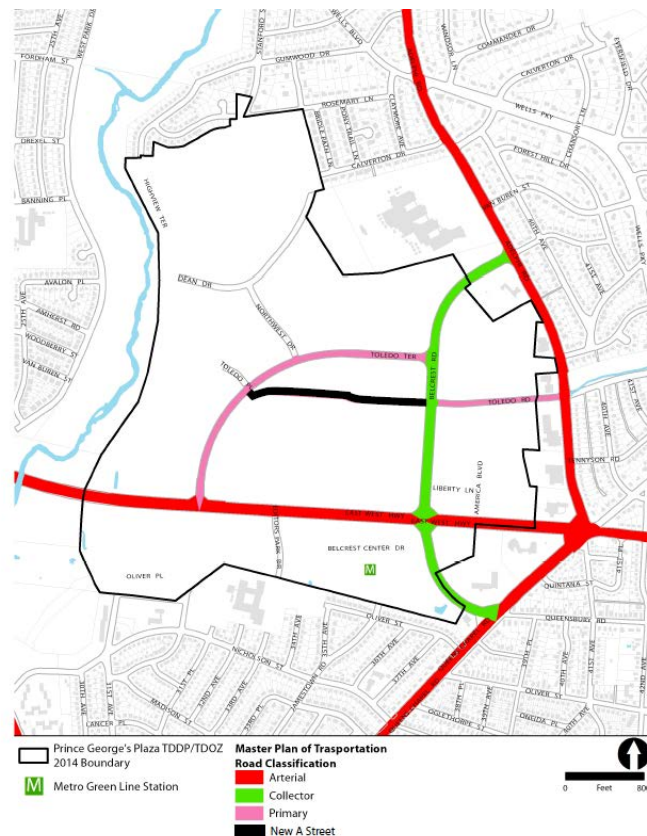
- 36 percent of respondents park their car in the District weekly
- 8.9 percent of respondents desire improved sidewalks and street lighting in the District
- 18 percent of respondents desire more convenient parking in the District
- 3.4 percent of respondents desire more frequent/reliable bus service 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 23rd 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.

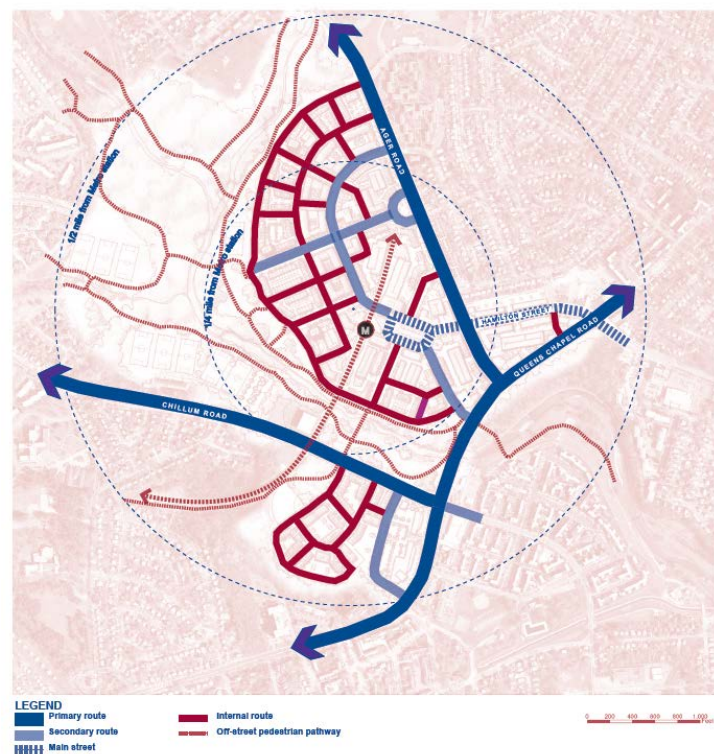
6. West Hyattsville Transit District Development Plan

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:

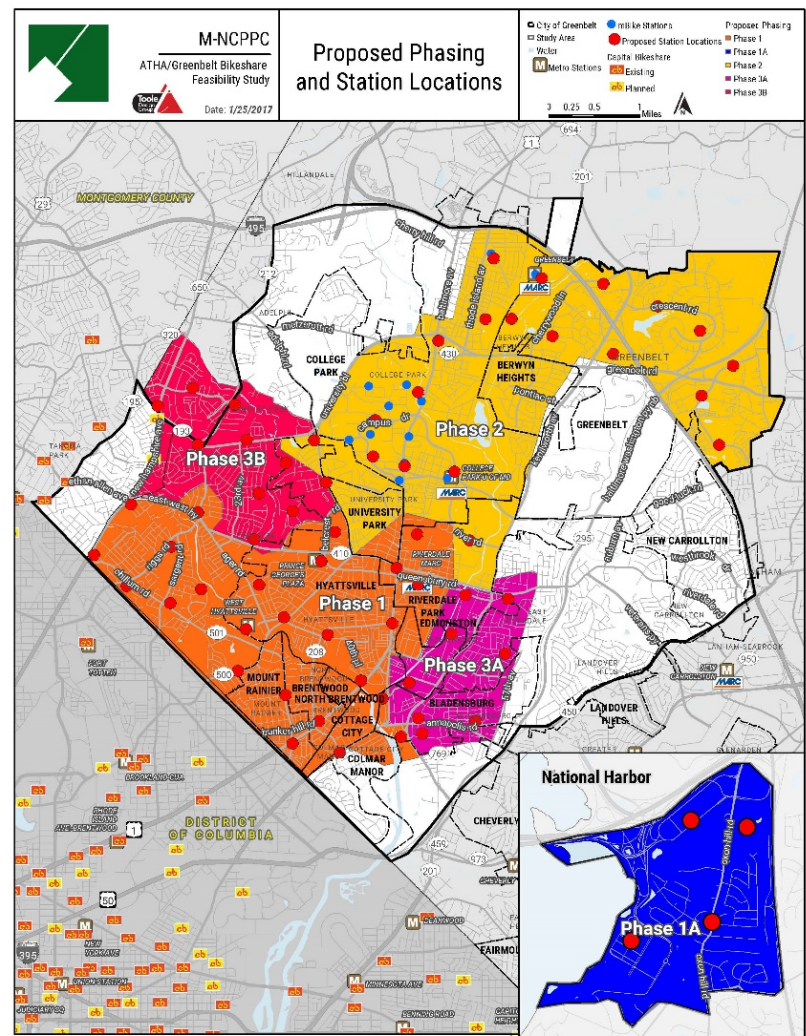
- Artway South – Chillum Road/34th Street
- Artway Central – Northwest Branch Stream Valley Park Trail
- Artway North – Hamilton Street/Gallatin Street

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 43rd avenue
- Installing reduced speed (20 mph) signs along Jefferson Street and 43rd Avenue
- Focusing on making improvements along key walking routes including 42nd Avenue, Longfellow Street, Jefferson Street, Gallatin Street, and 38th 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

Intersections (points)	Corridors (lines)
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

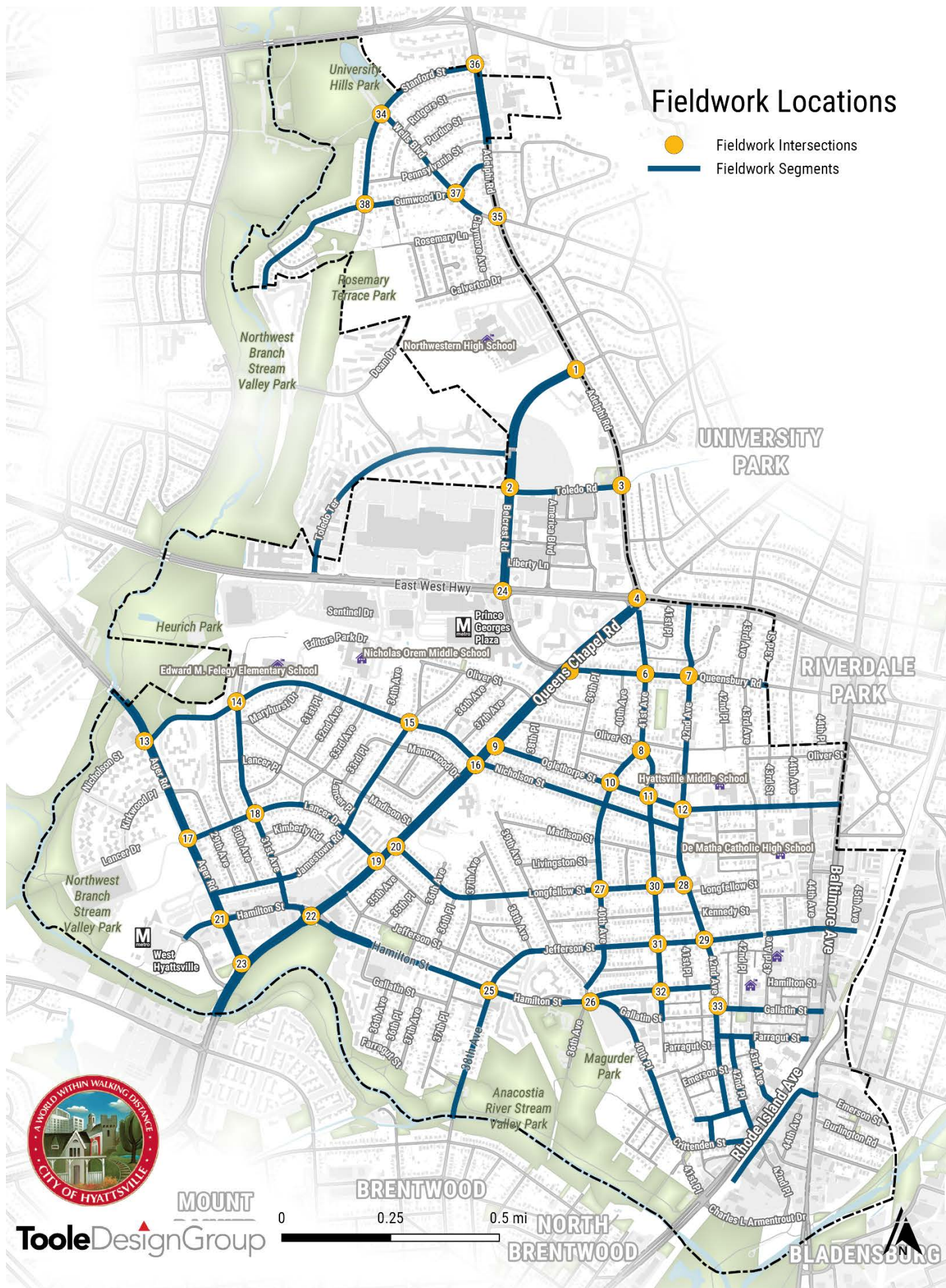
The following section describes the findings and observations from the data collection and provides thematic maps as a reference.

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 41st Avenue, 42nd 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 42nd 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 40th Avenue, 41st Avenue, and 42nd 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.

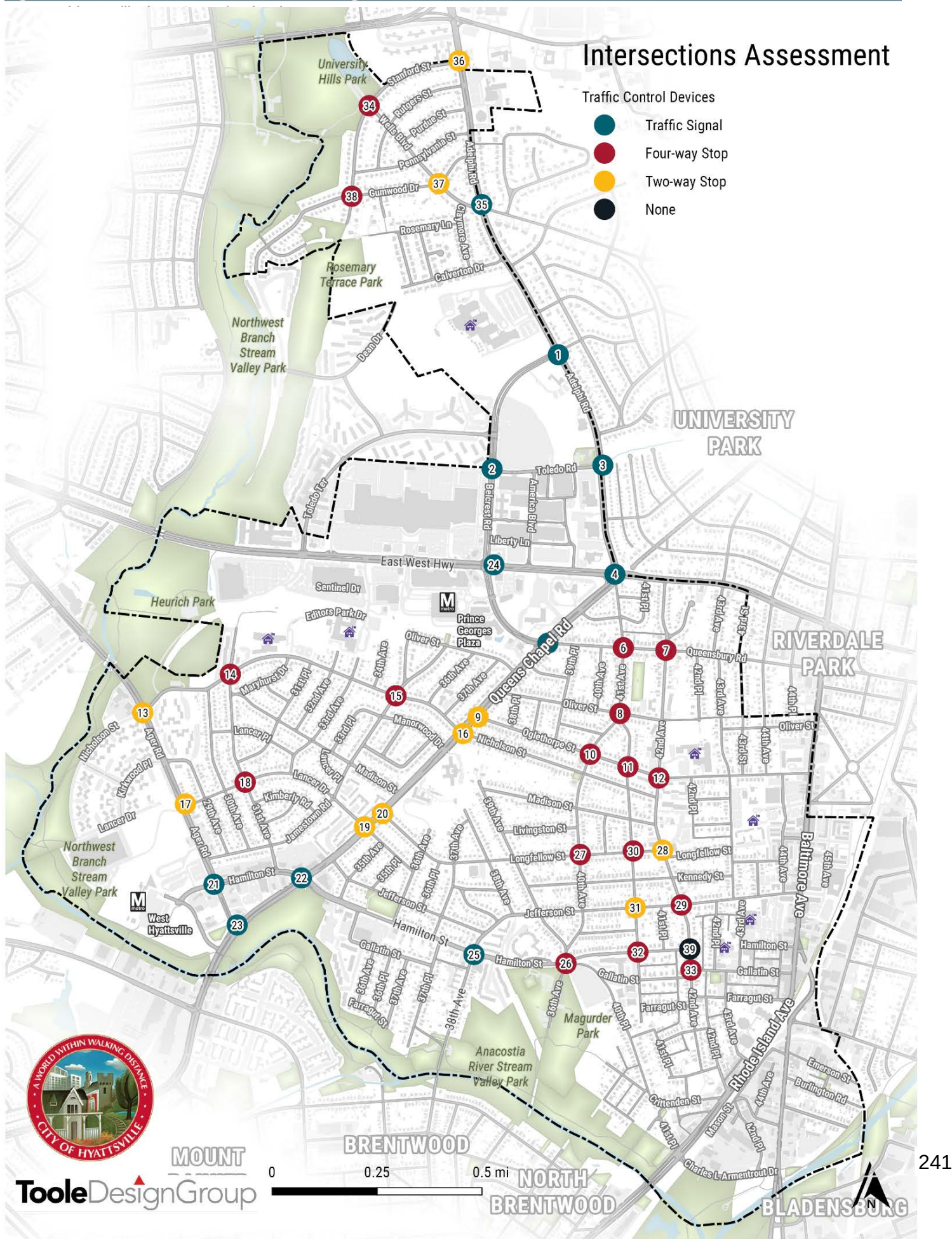
Figure 6: Existing High Visibility Crosswalk on Intersection of Oglethorpe Street and 42nd Avenue



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 9: Roadway Functional Classification

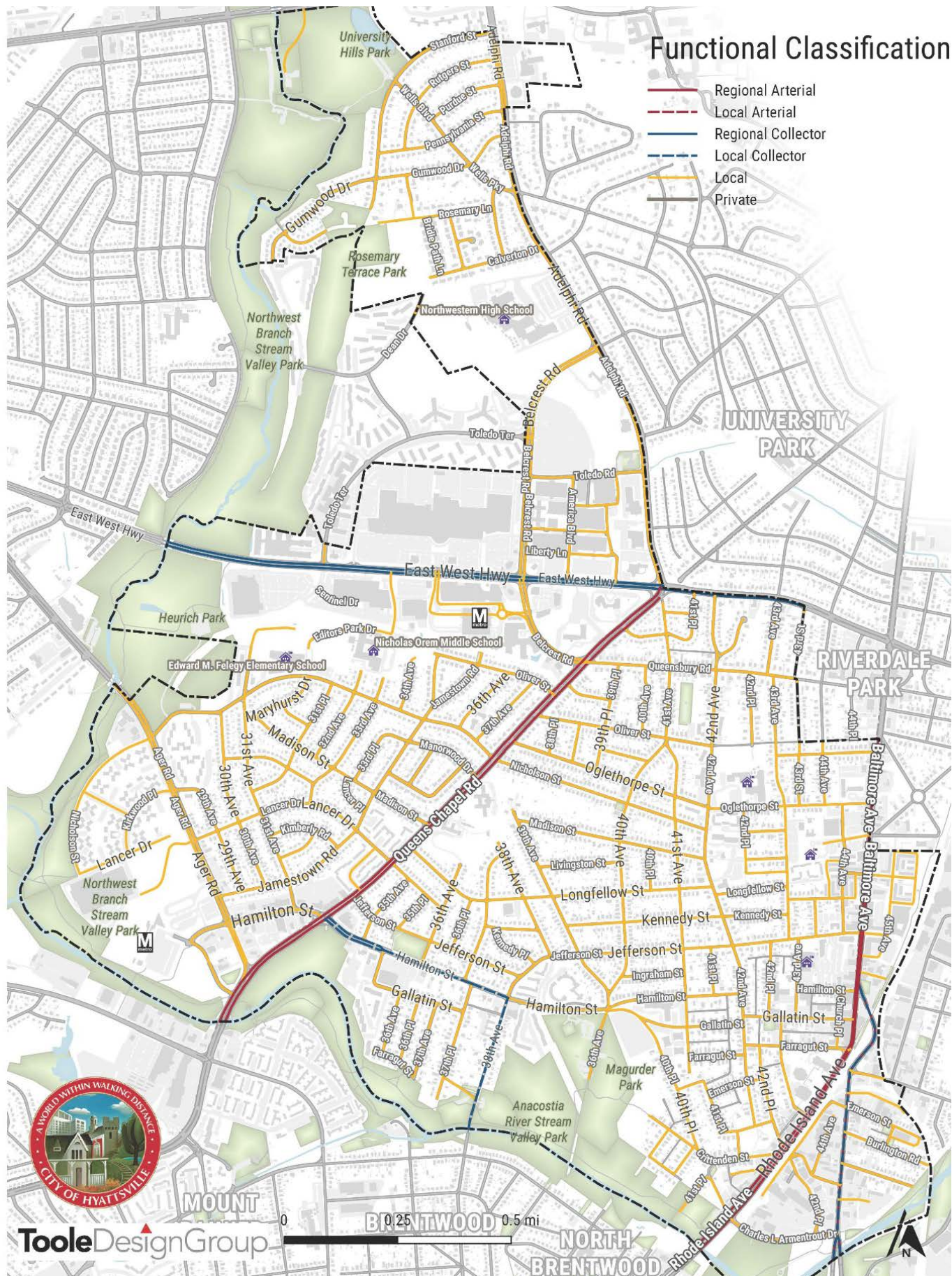
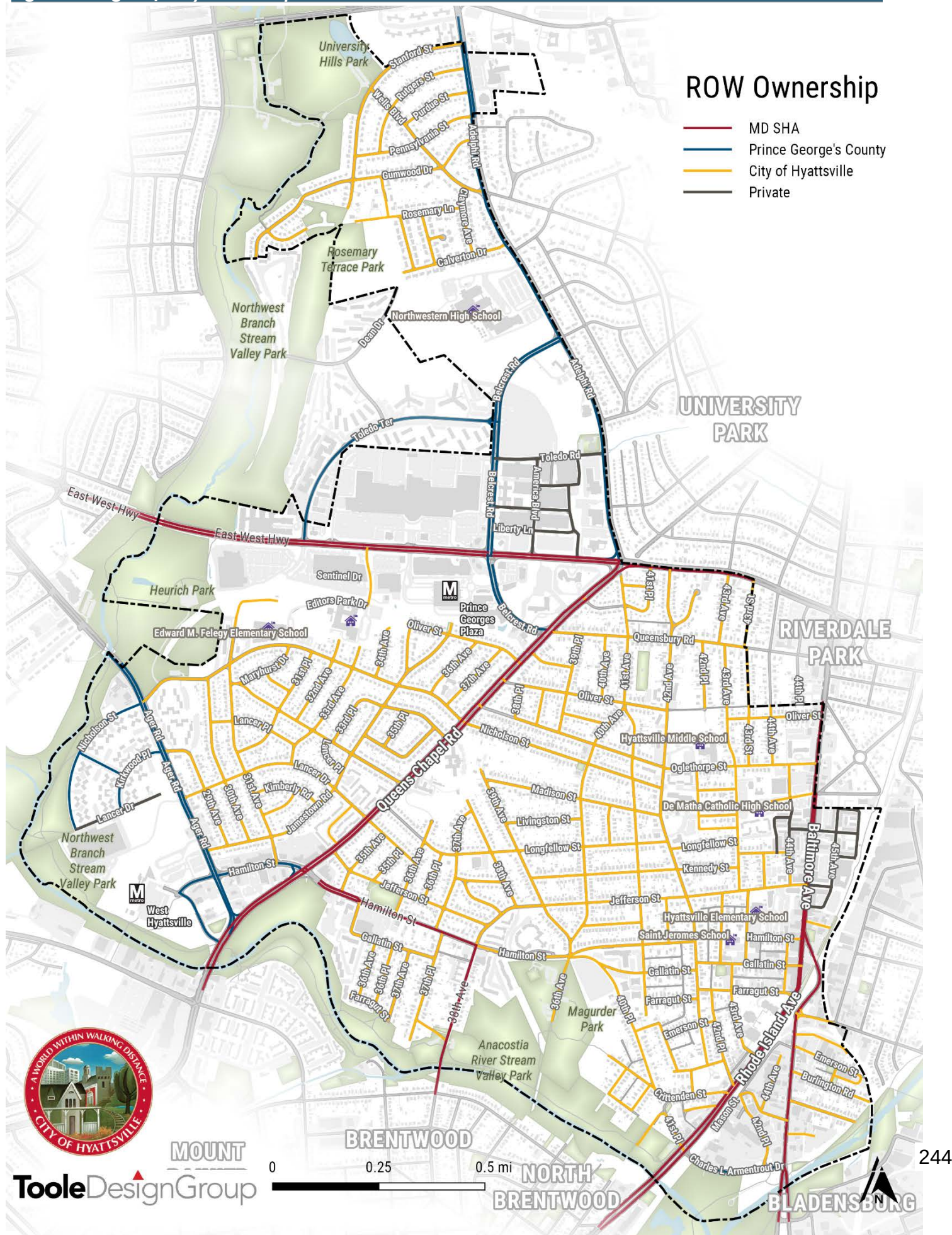


Figure 10: Right of Way Ownership



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
- 41st Avenue, from Oglethorpe Street to Nicholson Street
- 41st Avenue, from Longfellow Street to Kennedy Street
- 41st Avenue, from Ingraham Street to Farragut Street
- Decatur Street, from 42nd Place to 41st Place
- 42nd Avenue, from Decatur Street to Crittenden Street
- Rhode Island Avenue, from Baltimore Avenue (Route 1) to 42nd 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 38th Avenue, 41st Avenue, and 42nd Avenue.

Figure 12 A: Sidewalk Coverage

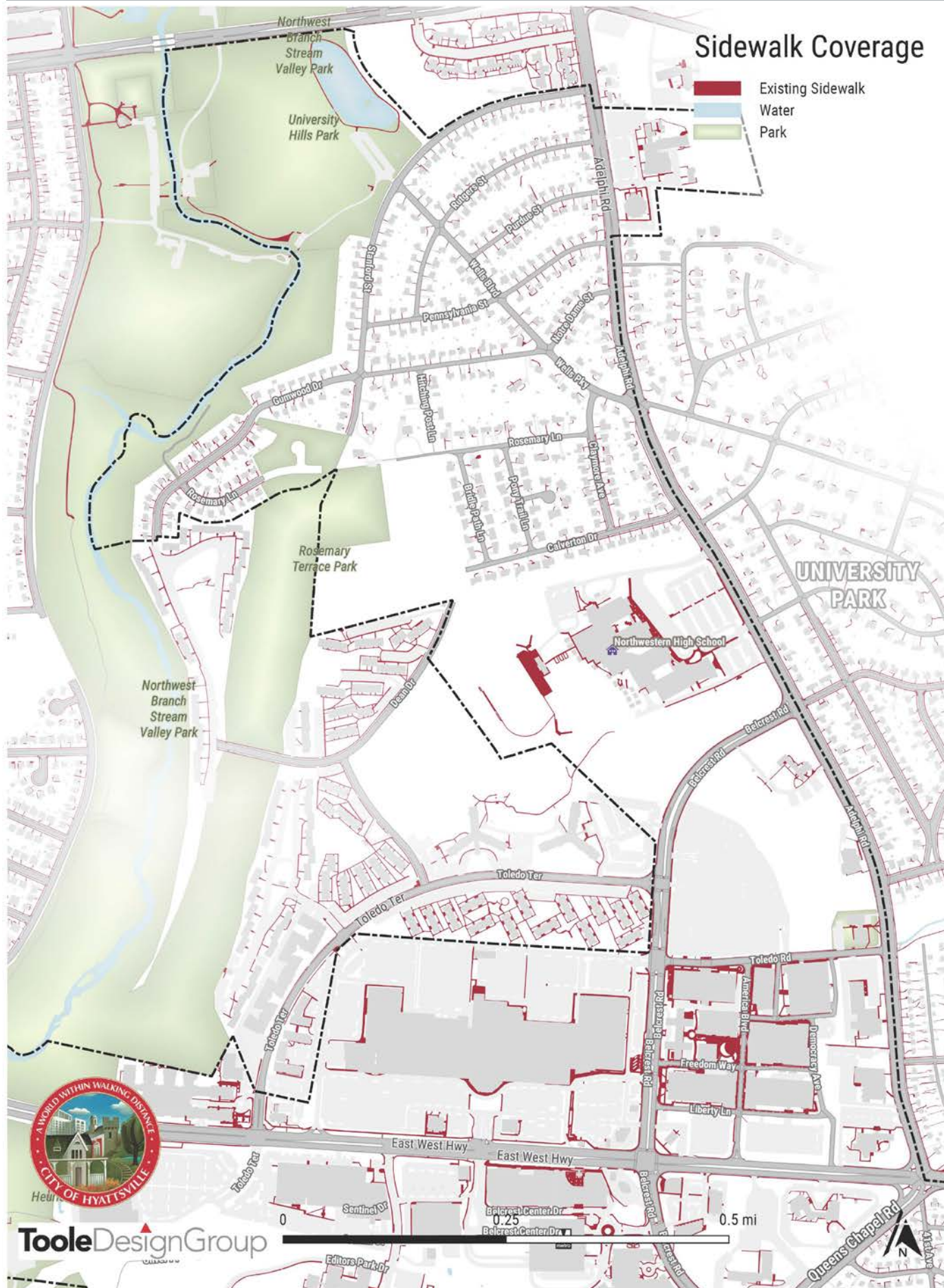


Figure 13 B: Sidewalk Coverage

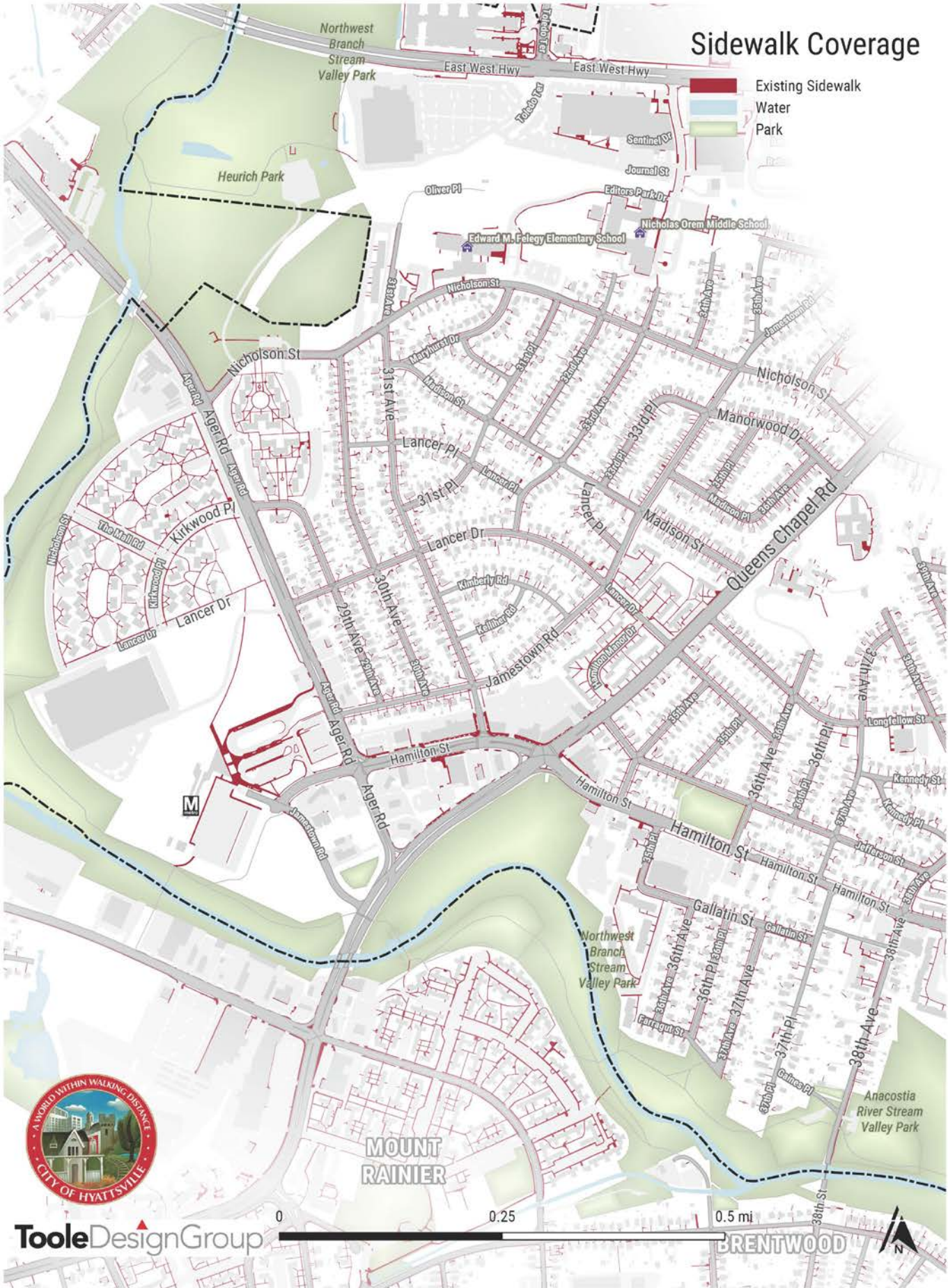


Figure 14 C: Sidewalk Coverage

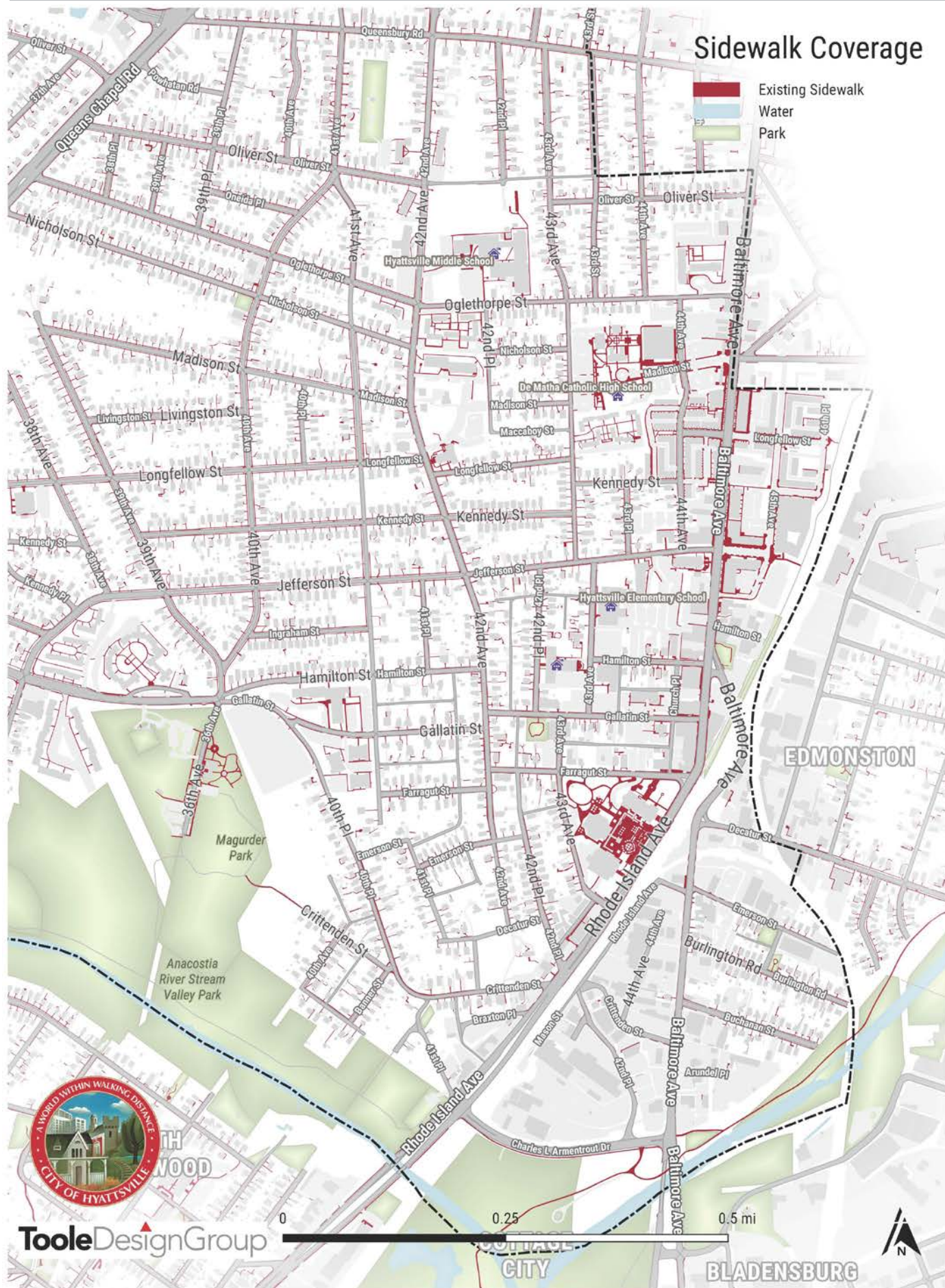
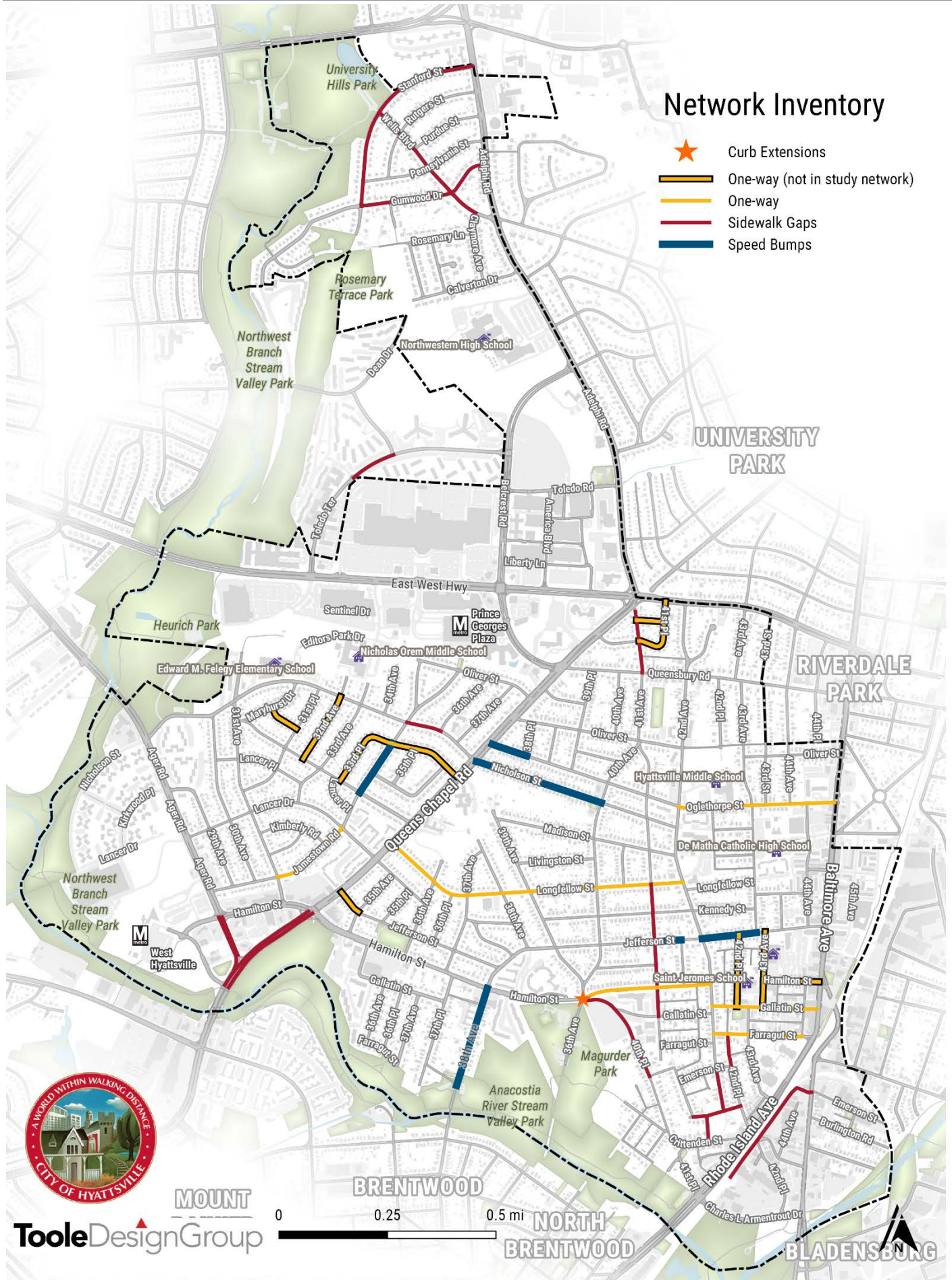


Figure 15: Segment Assessments



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)

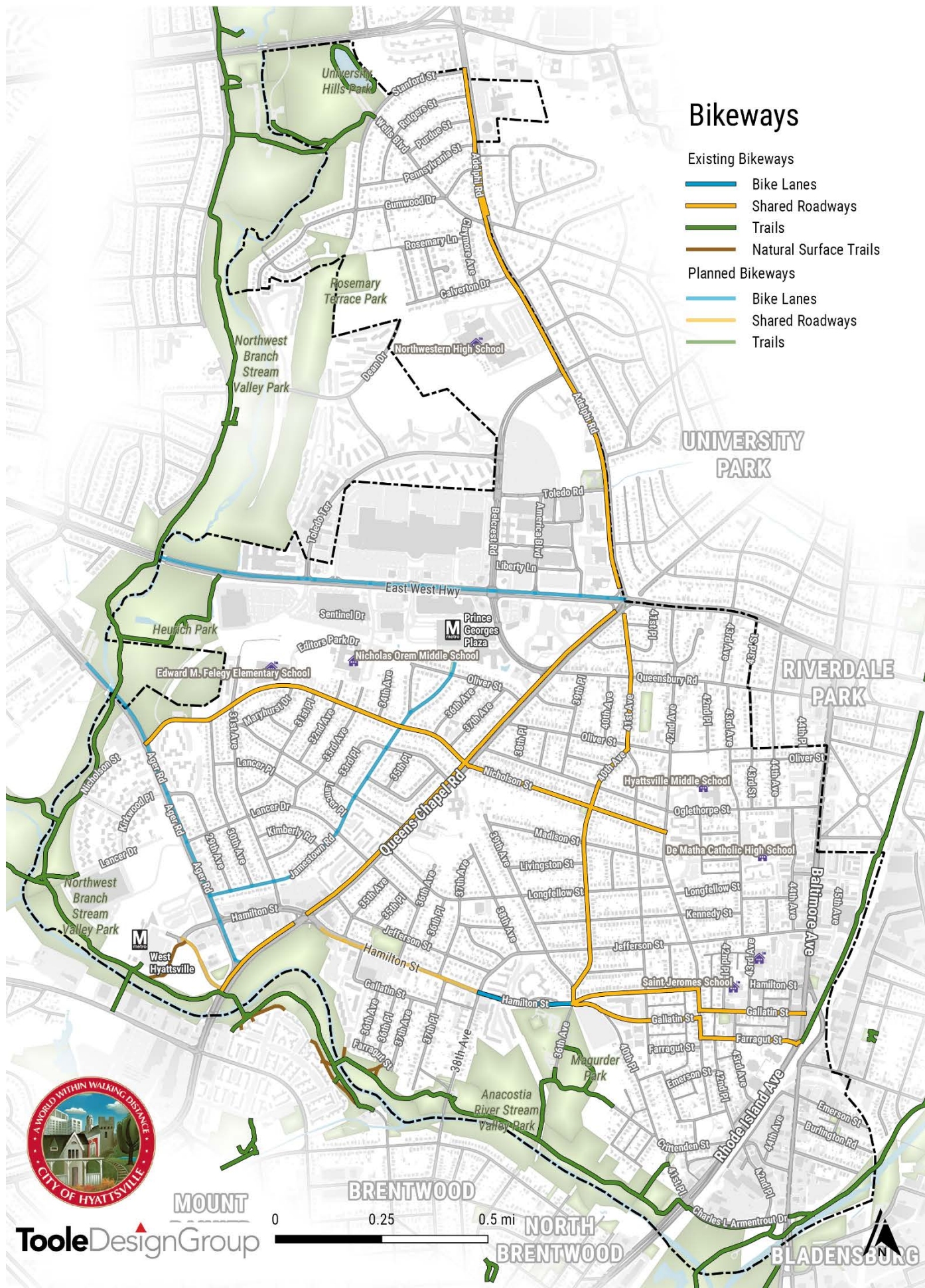
Type of Facility	Miles
Bike Lane	0.22
Trail	24.49
Shared Roadway	6.44
Total	31.15

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

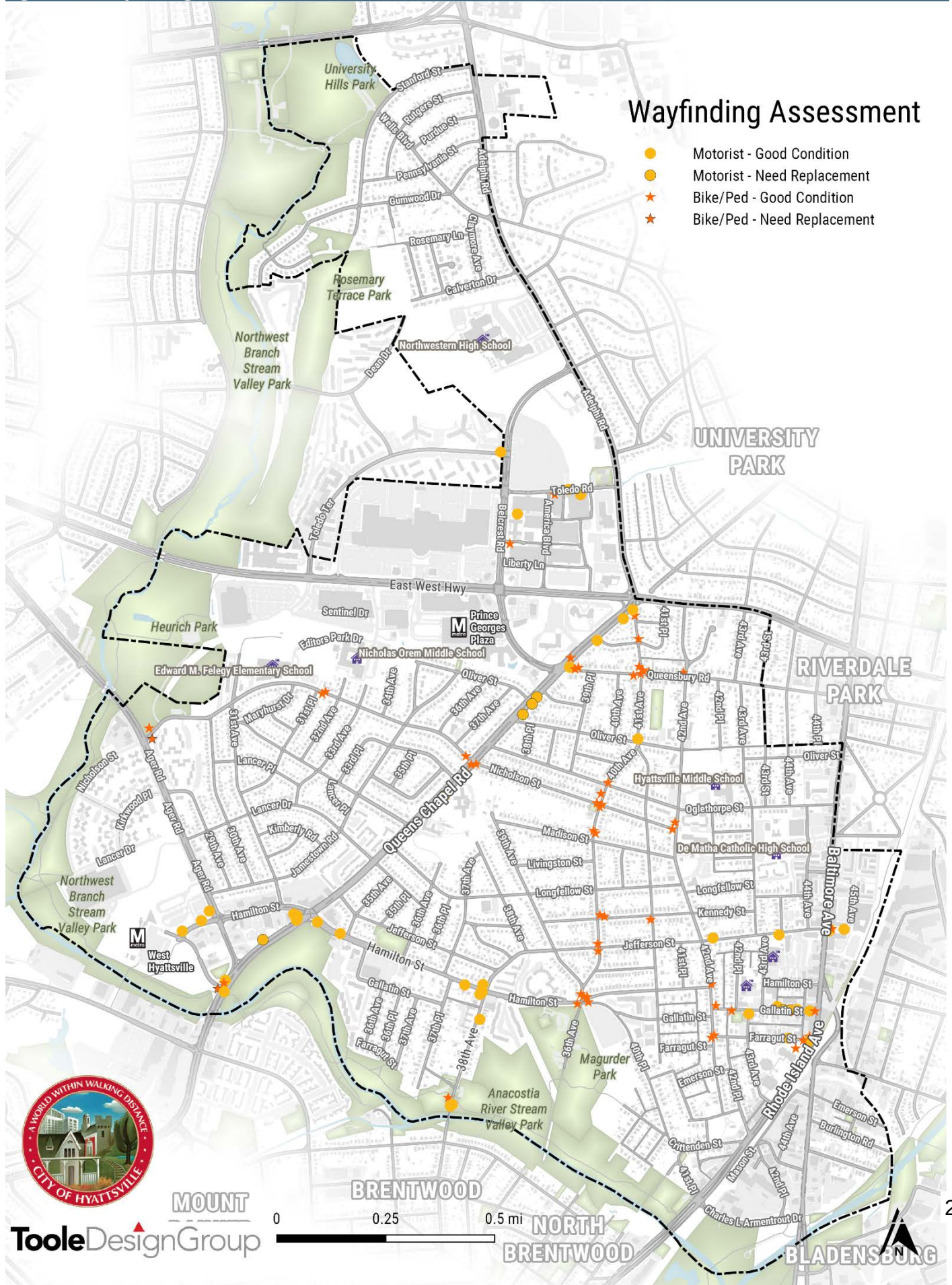
Existing wayfinding signs are generally in good condition and are concentrated along existing bicycle and pedestrian routes. Figure 21 presents the types and conditions of existing wayfinding signs assessed. Many of the signs found throughout the study area, however, do not comply with MUTCD size, color 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 42nd 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.

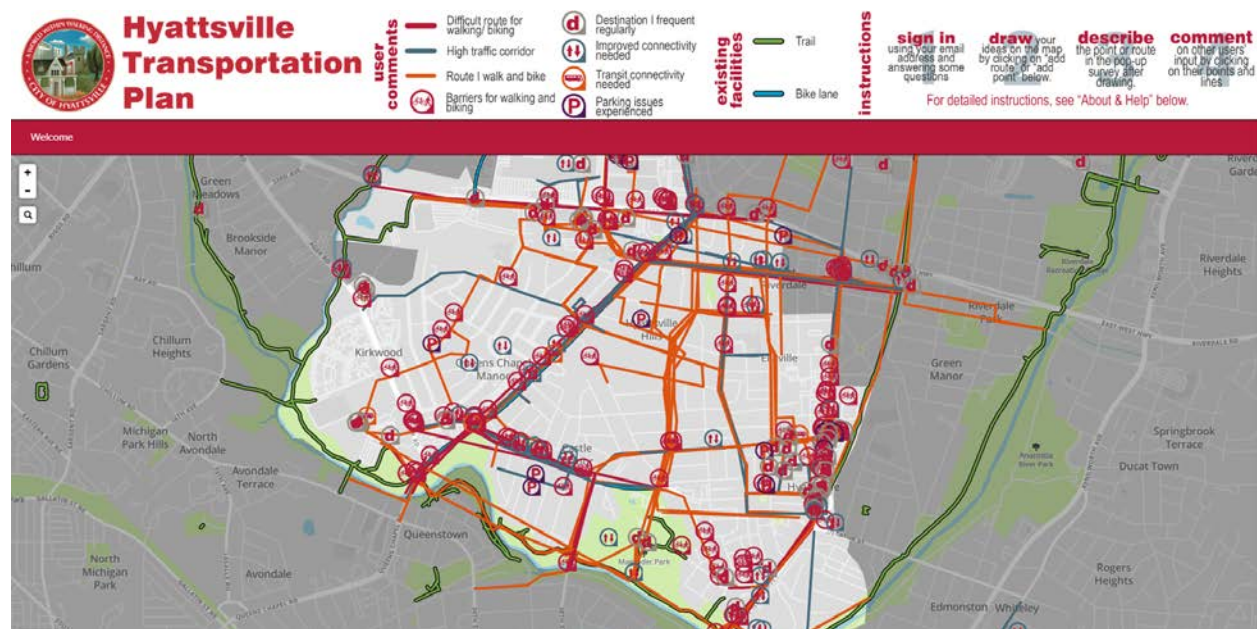
Figure 23: Wayfinding Assessment



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

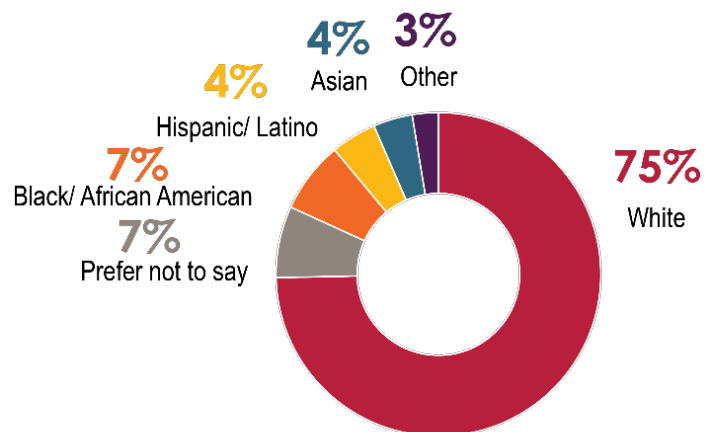


Wikimap users were also asked to complete a short survey to help the Study Team understand their background, mobility habits, and concerns. The following is a summary of demographic characteristics from wikimap respondents:

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.

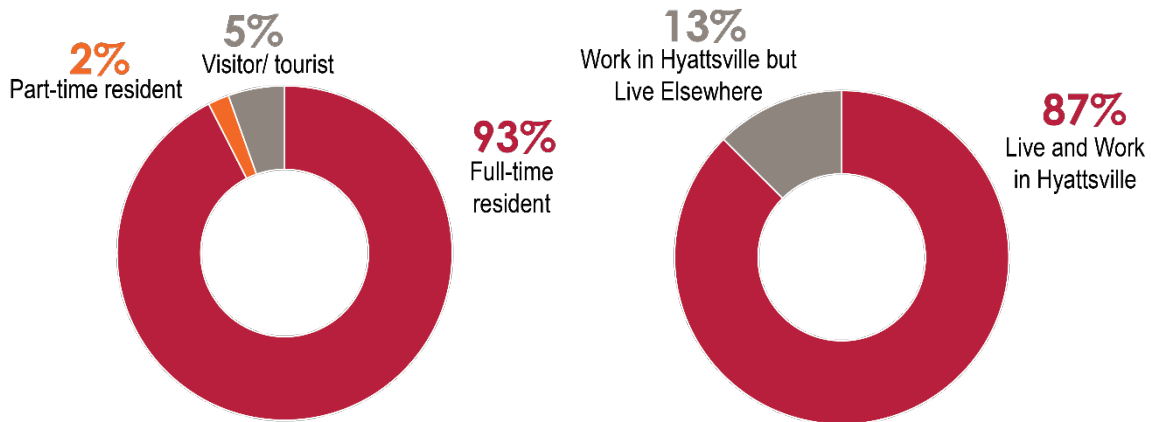
Figure 25: Demographic Distribution of Respondents



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)

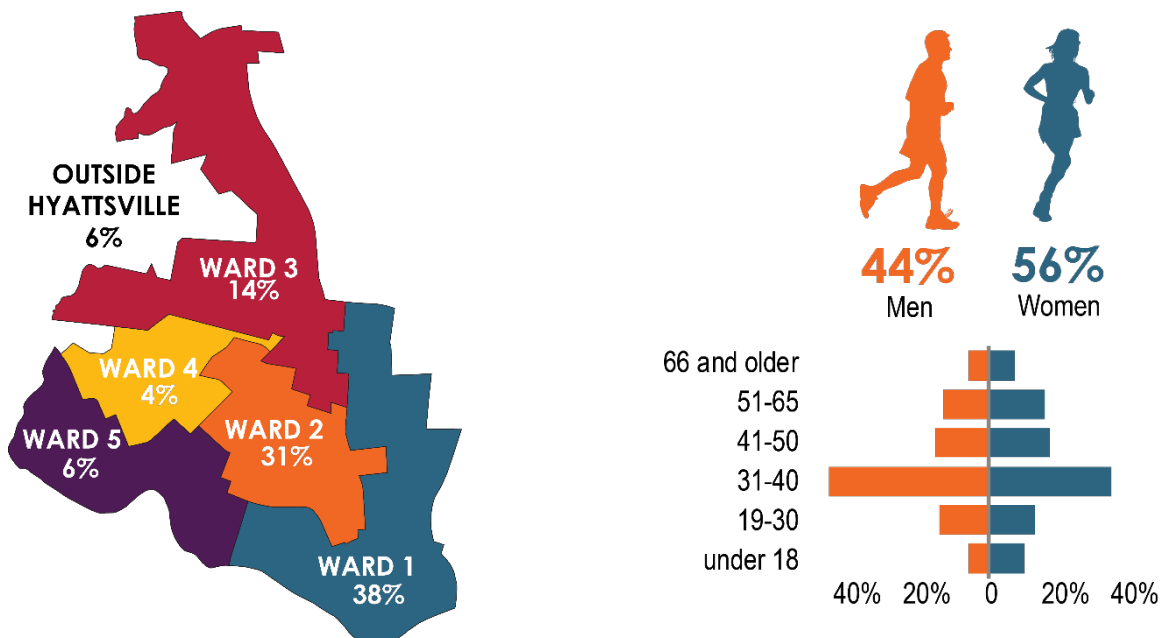


The majority of respondents (69 percent) live in Wards 1 and 2 while only around 10 percent of respondents live in Wards 4 and 5. City Staff are actively working to increase participation from these communities, however have so far been unsuccessful.

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.

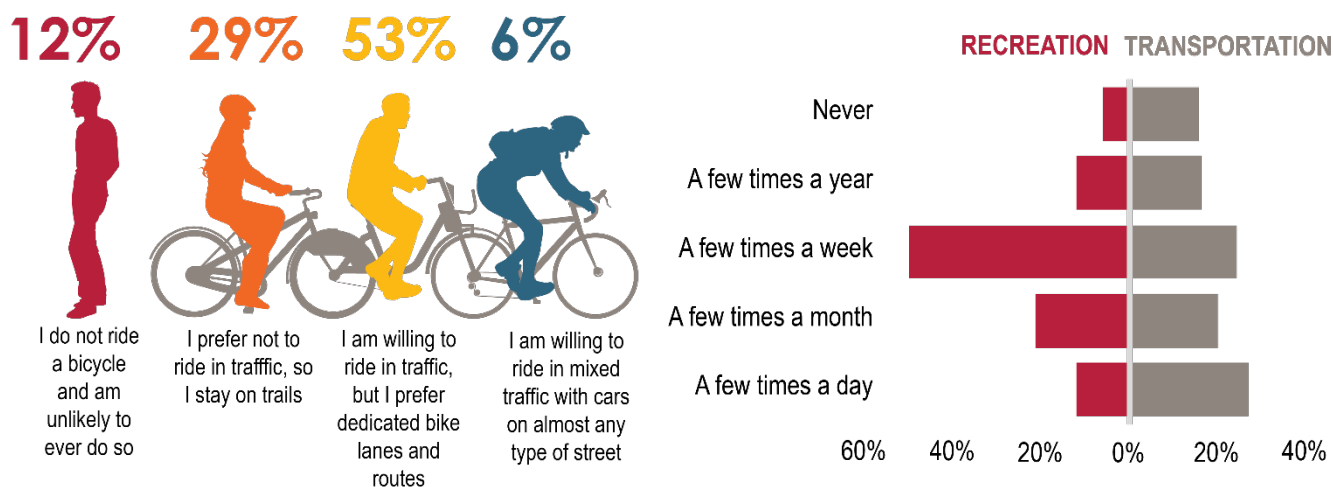
Figure 27: Ward of Residency (Left) - Age and Sex (Right)



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.

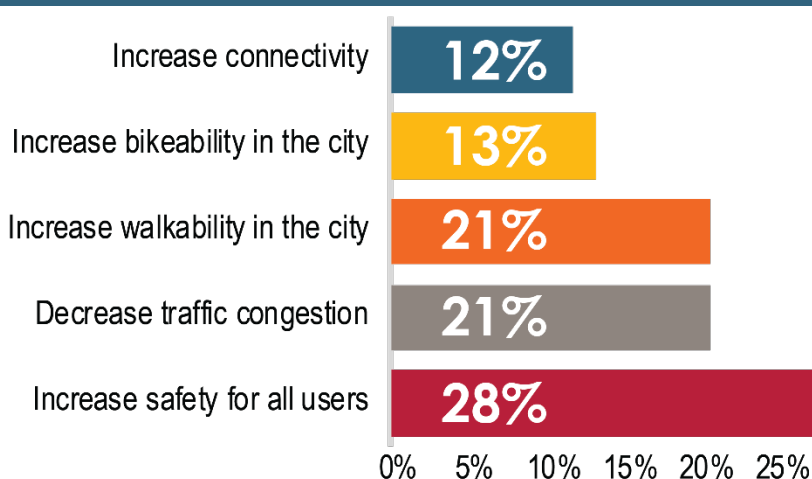
Figure 28: Bicycling Habits (left) and Walking Habits (right)



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:

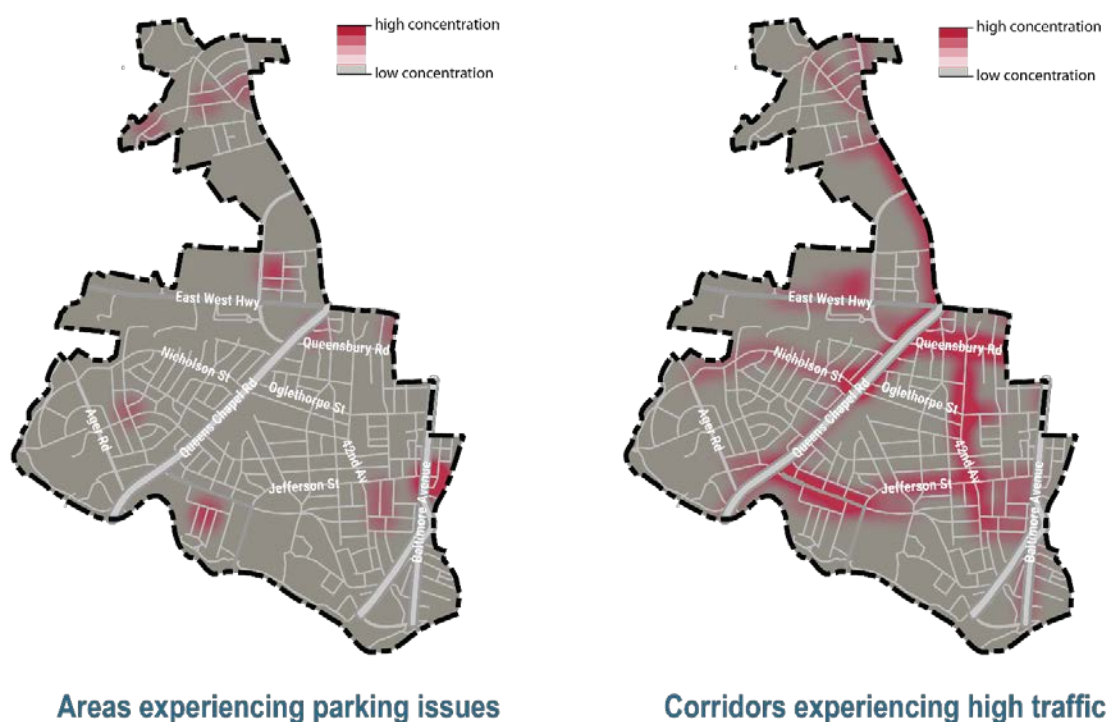
- 42nd Avenue
- Queensbury Road
- Nicholson Street
- Queens Chapel Road
- Jefferson Street
- Hamilton Street

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)



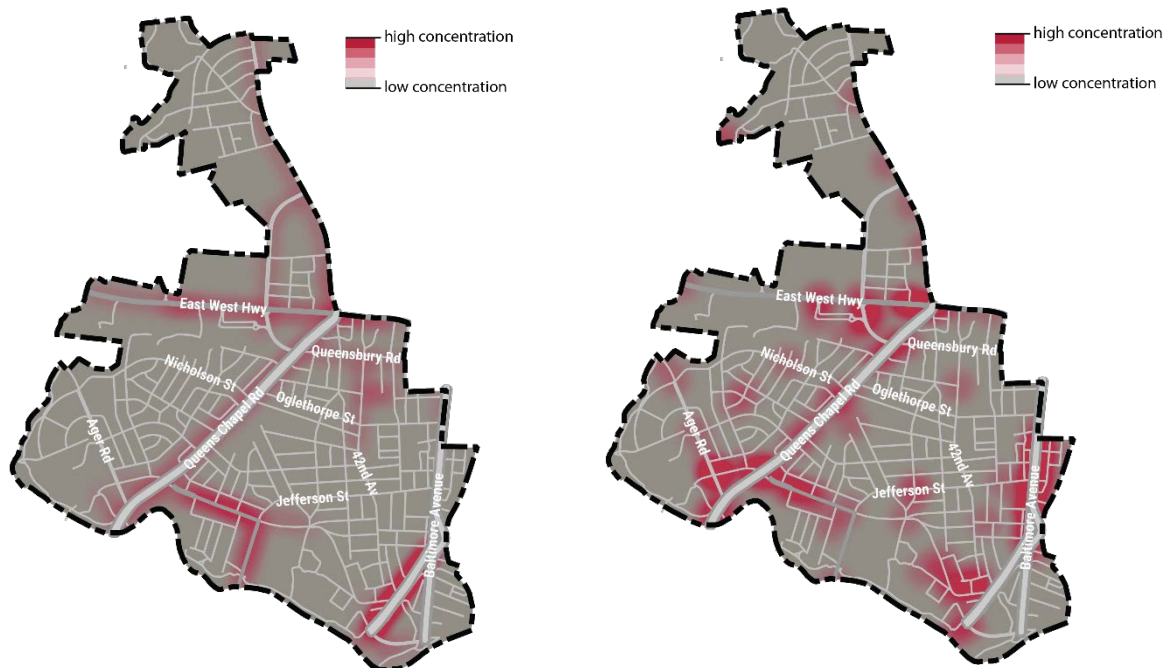
Some of the parking-related comments indicated that roads are too narrow to accommodate two-way traffic as well as parking. Other comments noted that people from other jurisdictions park their cars on local streets (where parking is free) taking away parking spaces from residents.

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)
- 42nd Avenue (Oglethorpe Street to East-West Highway (MD-410))
- Hamilton Street (from Queens Chapel Road to 38th Street)
- 38th 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

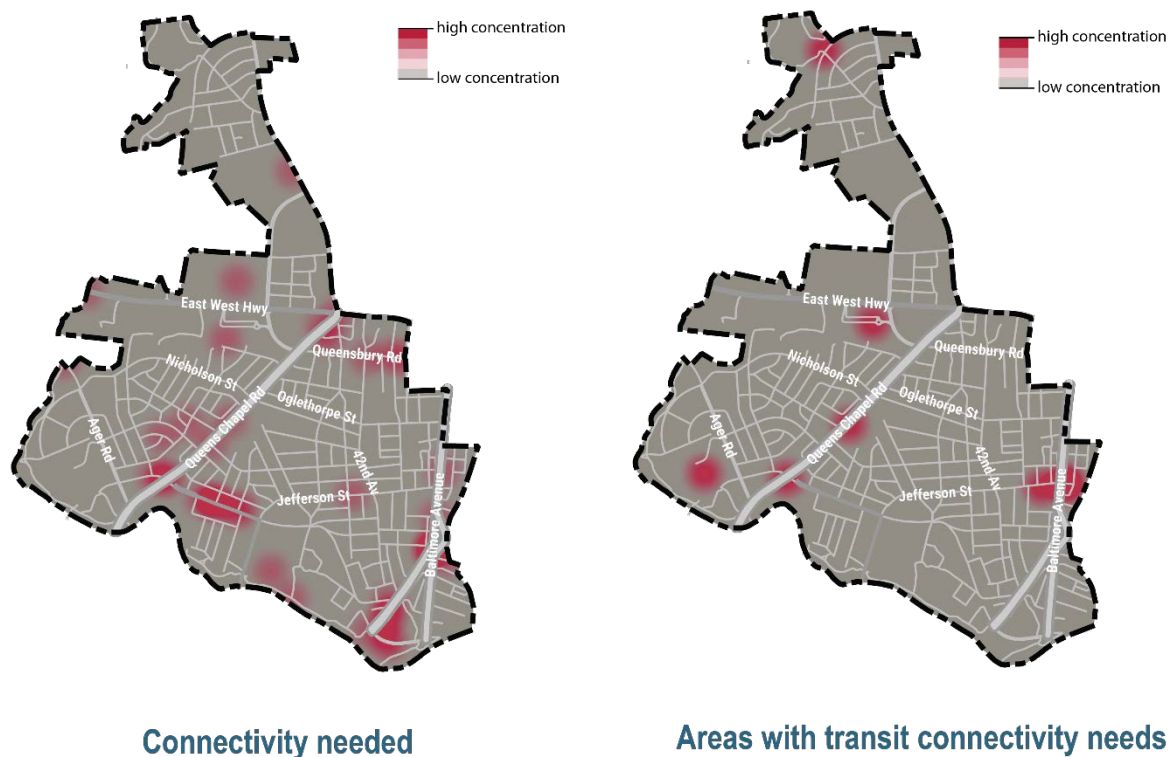
The issues that were most noted included:

- 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)

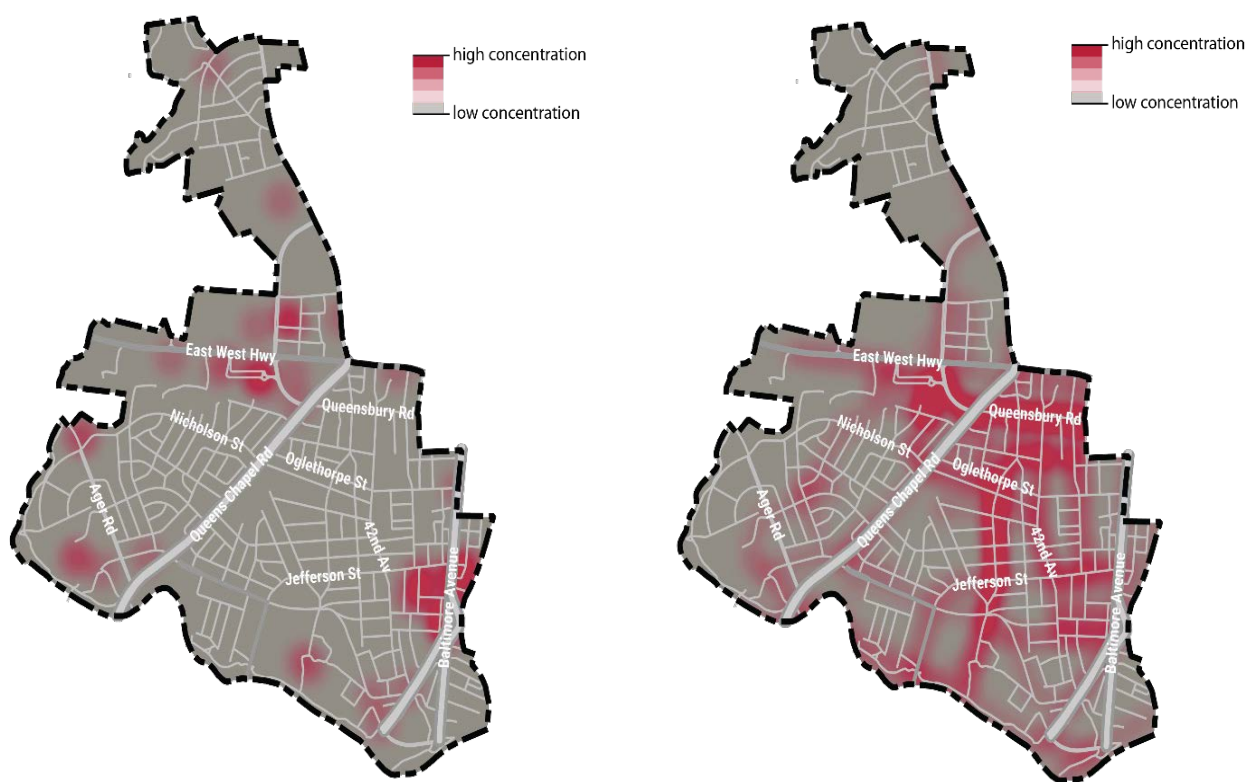


The wikimap received 47 comments related to the need for improved pedestrian and bicycle connectivity. Many of these comments focused on the need to provide better connections to the Northeast and Northwest Branch Trails, as well as the existing Trolley Trail. Other comments noted the need for additional 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
- 40th Avenue
- 42nd Avenue
- Oglethorpe Street

5. School Area Circulation Observations

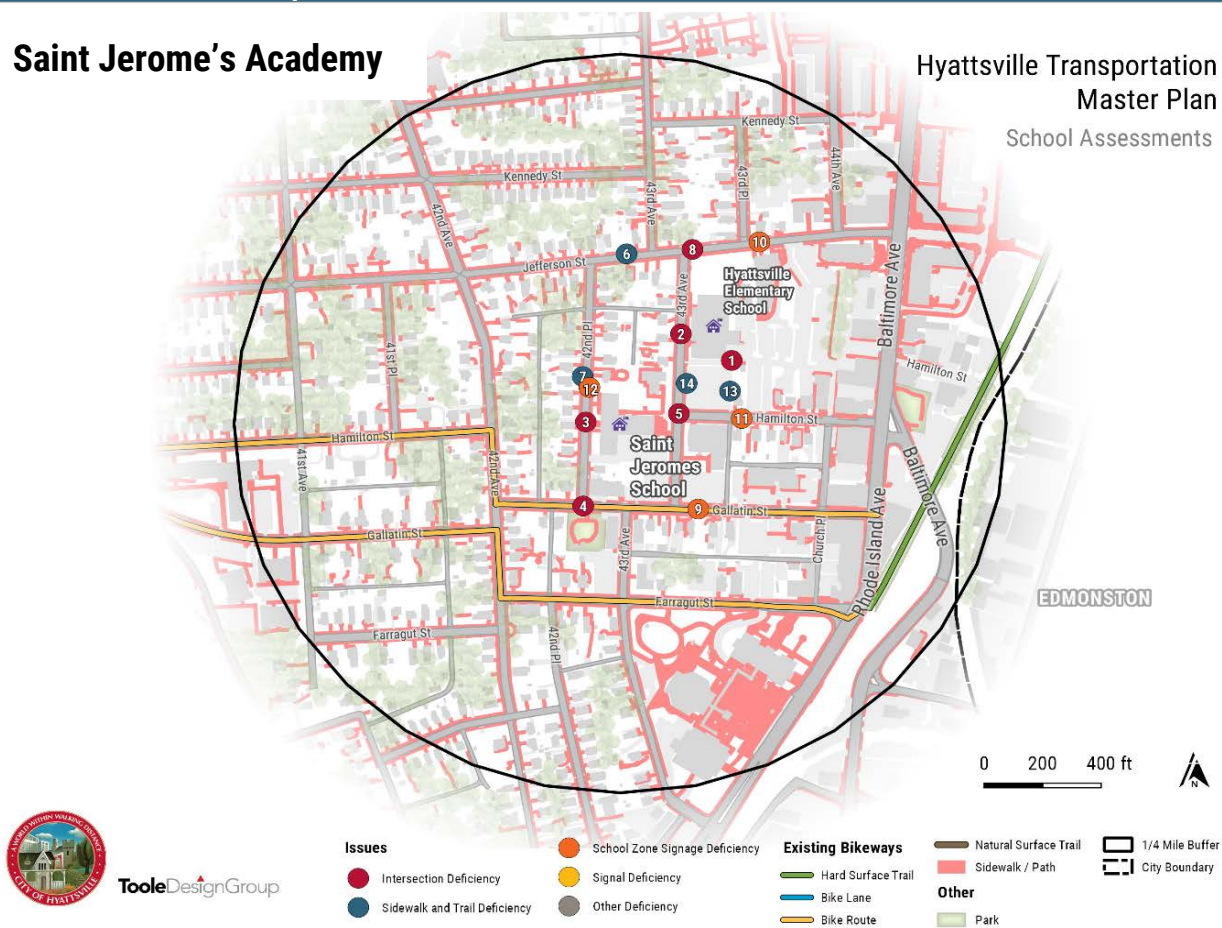
To assess multimodal connectivity and safety for students walking and biking to school, school area circulation observations were conducted between September 13 and 21, 2017. These field observations focused on documenting existing infrastructure within a ¼ mile radius around each of the following schools:

- St. Jerome Academy (5207 42nd Place)
- Hyattsville Elementary School (5311 43rd Avenue)
- Hyattsville Middle School (6001 42nd 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.

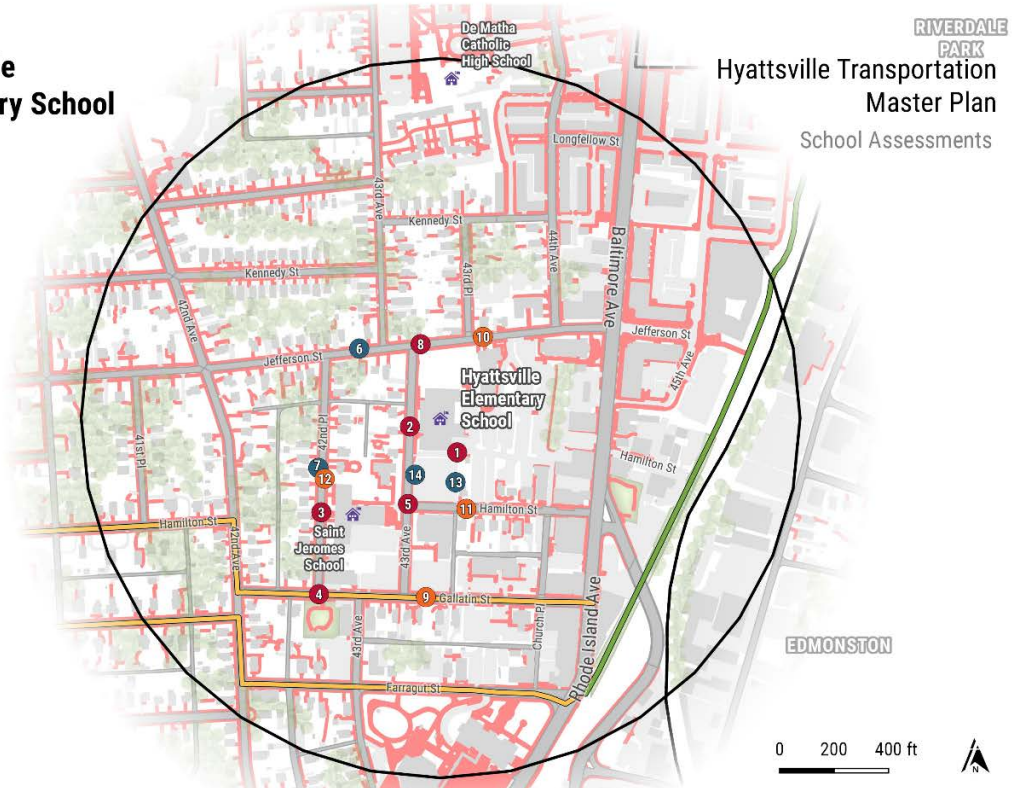
Figure 34: School Area Deficiencies

Saint Jerome's Academy



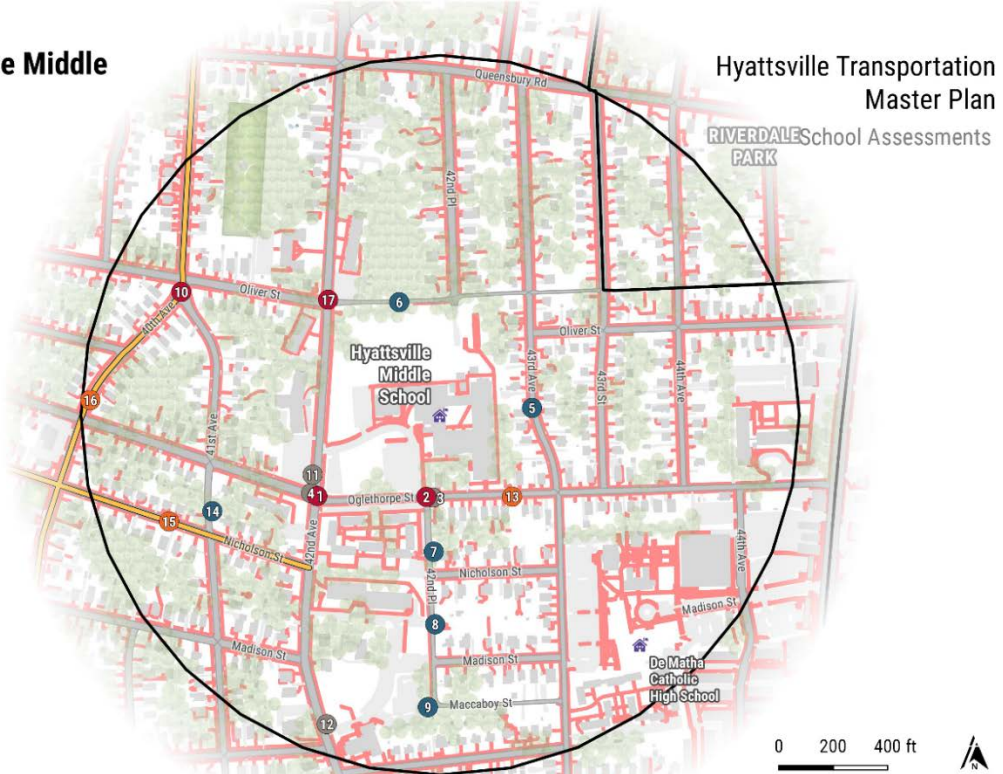
Hyattsville Elementary School

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

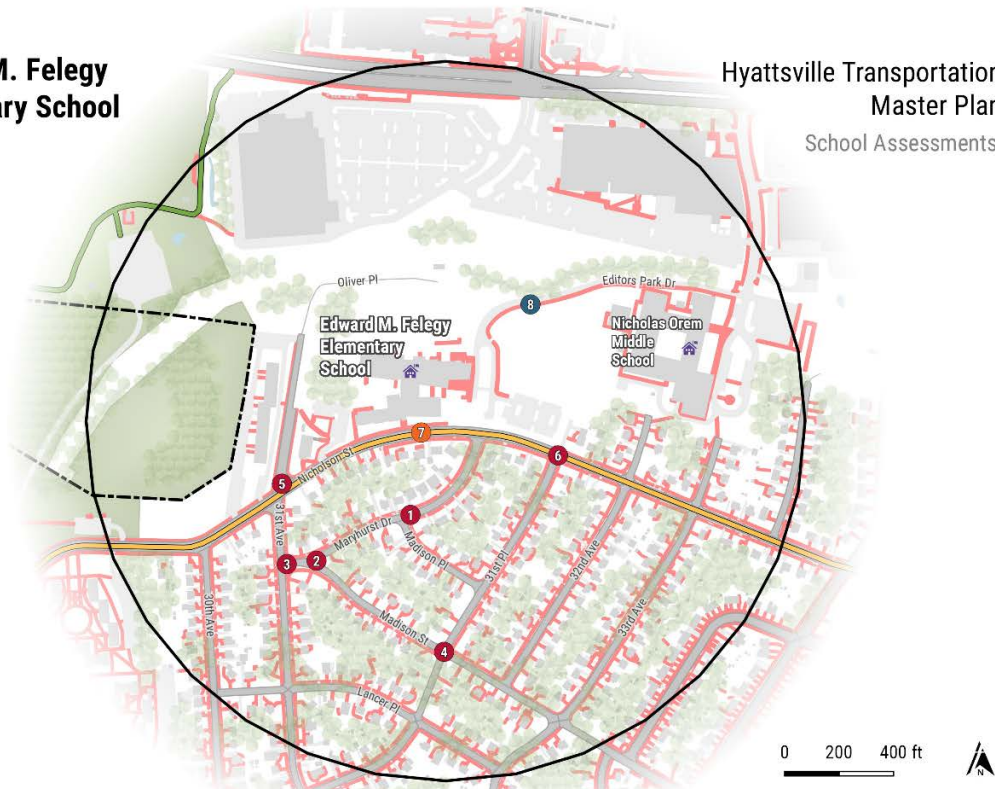
Other

- Natural Surface Trail
- Sidewalk / Path
- Park

- 1/4 Mile Buffer
- City Boundary

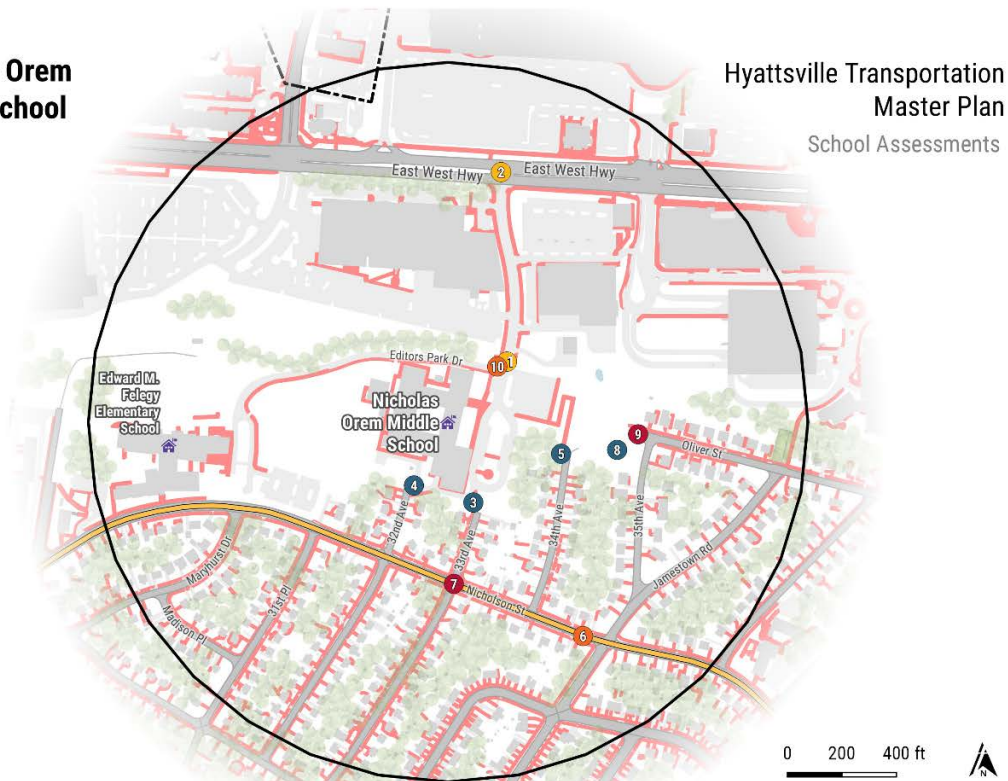
Edward M. Felegy Elementary School

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

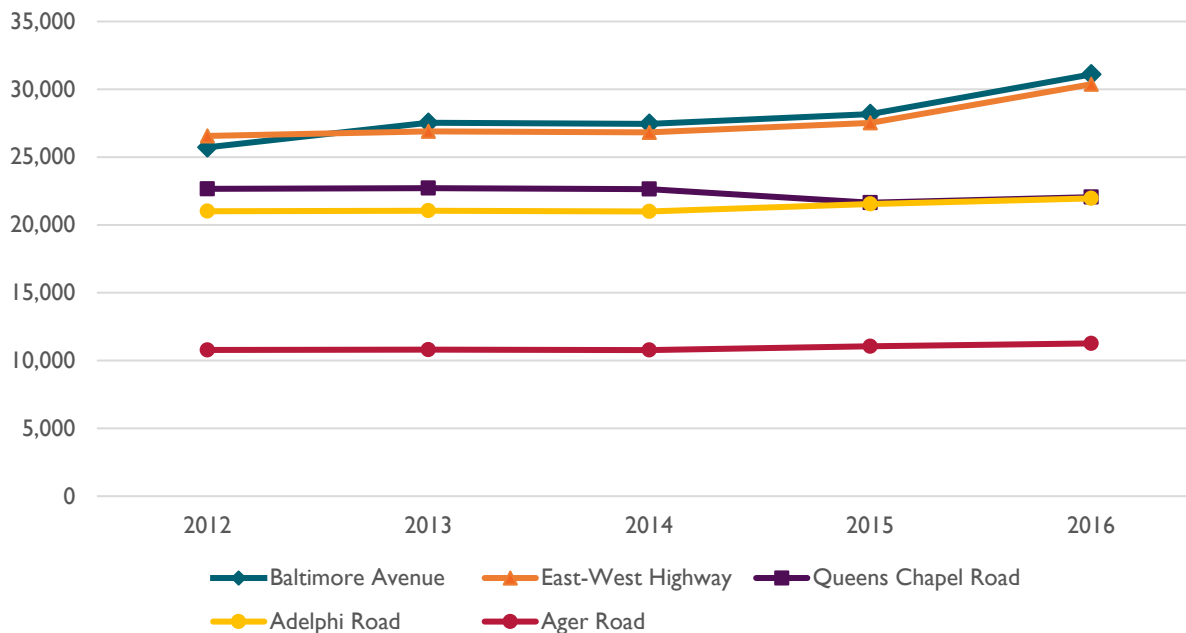
To understand the changes in traffic volumes and patterns over time, annual average daily traffic (AADT) volumes were examined for 2010 through 2016 – the most recent data available. AADTs are determined to provide an estimate of the daily bi-directional volumes at specific locations or along specific 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.

Table 7: Intersection Volumes Balanced		
Intersections	AM	PM
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
- 95th-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, 95th-percentile queues per movement were also evaluated. The 95th 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 11. 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 11 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 95th percentile queue length for each movement at the intersections were compared with available storage for turn lanes and between adjacent intersections. The results of 95th percentile queues were reported in Appendix I-F. The following section describes the existing traffic operational deficiencies based on delay and 95th-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 1) and US 1 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 1 Alternate operate at degraded conditions (LOS E or worse) as described below.

- Baltimore Avenue (Route 1)/East-West Highway
- Baltimore Avenue/Route 1 Alternate/Hamilton Street South
- Route 1 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)



Figure 38: Level of Service (PM 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 95th-percentile queue spillover impacts Queensbury Road intersection during both AM and PM peak hours. The eastbound 95th-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 95th 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 42nd 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 95th-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 95th-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 95th-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 95th-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, 95th 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 95th-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:

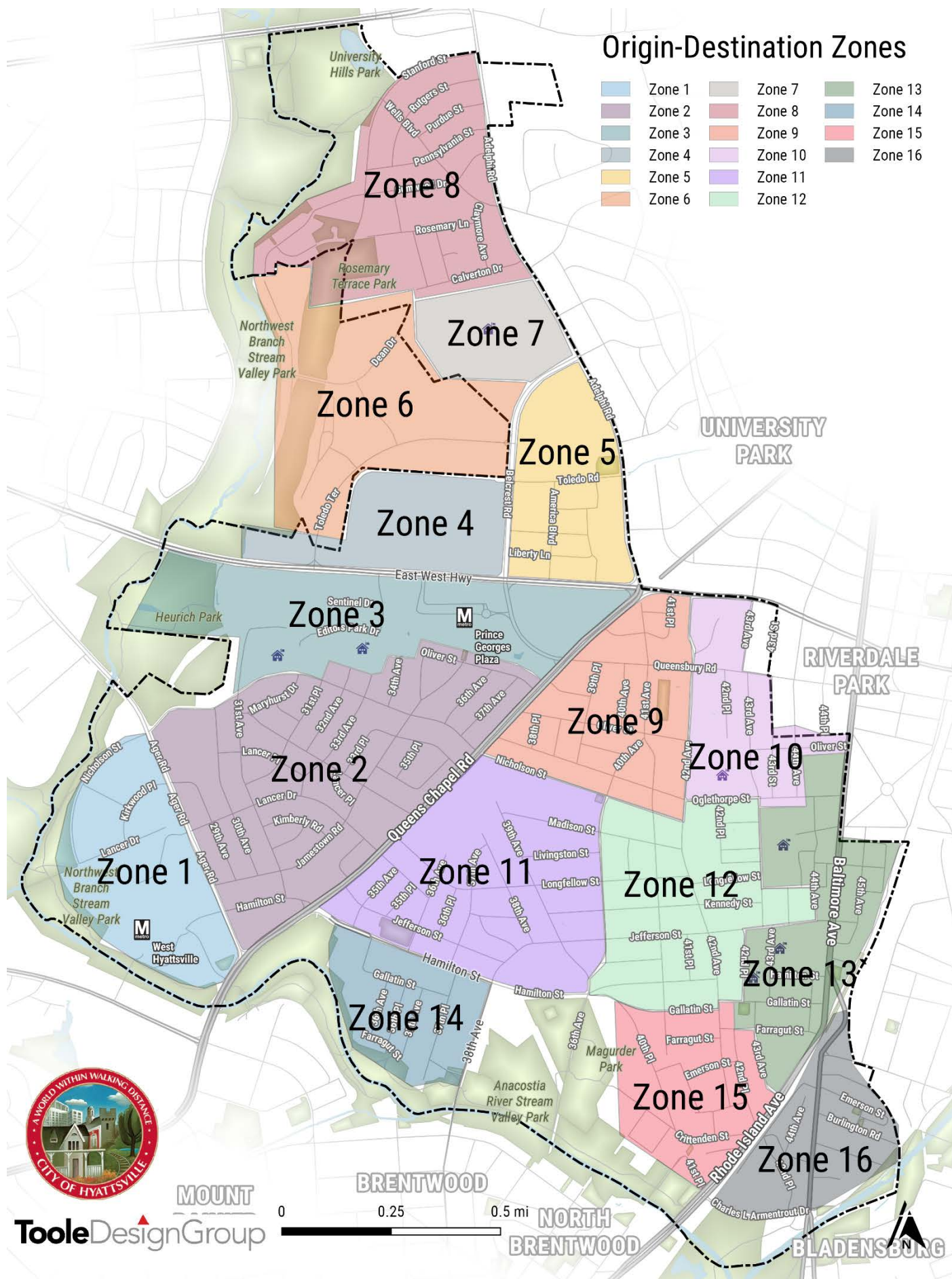
- | | |
|--|-------------------------------|
| • Ager Road (2 filters) | • Queensbury Road (2 filters) |
| • Nicholson Street, west of Queens Chapel Road (2 filters) | • Hamilton Street (2 filters) |
| • Nicholson Street, east of Queens Chapel Road | • Jefferson Street |
| • Belcrest Road, north of Hwy 410 | • Hamilton Street |
| • Belcrest Road, south of Hwy 410 | • 40 th Place |
| | • 42 nd Avenue |
| | • 43 rd 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)

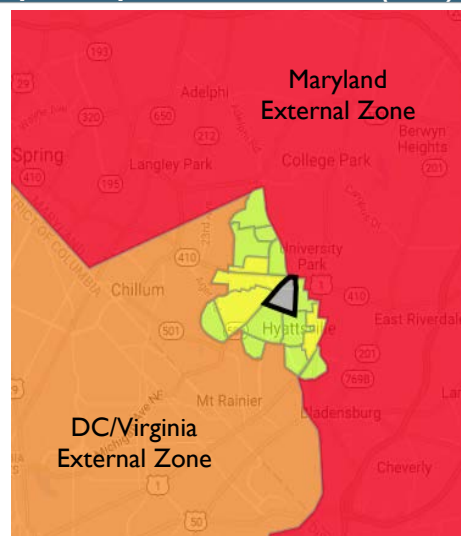


Table 12: Average Origin Rates

	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.

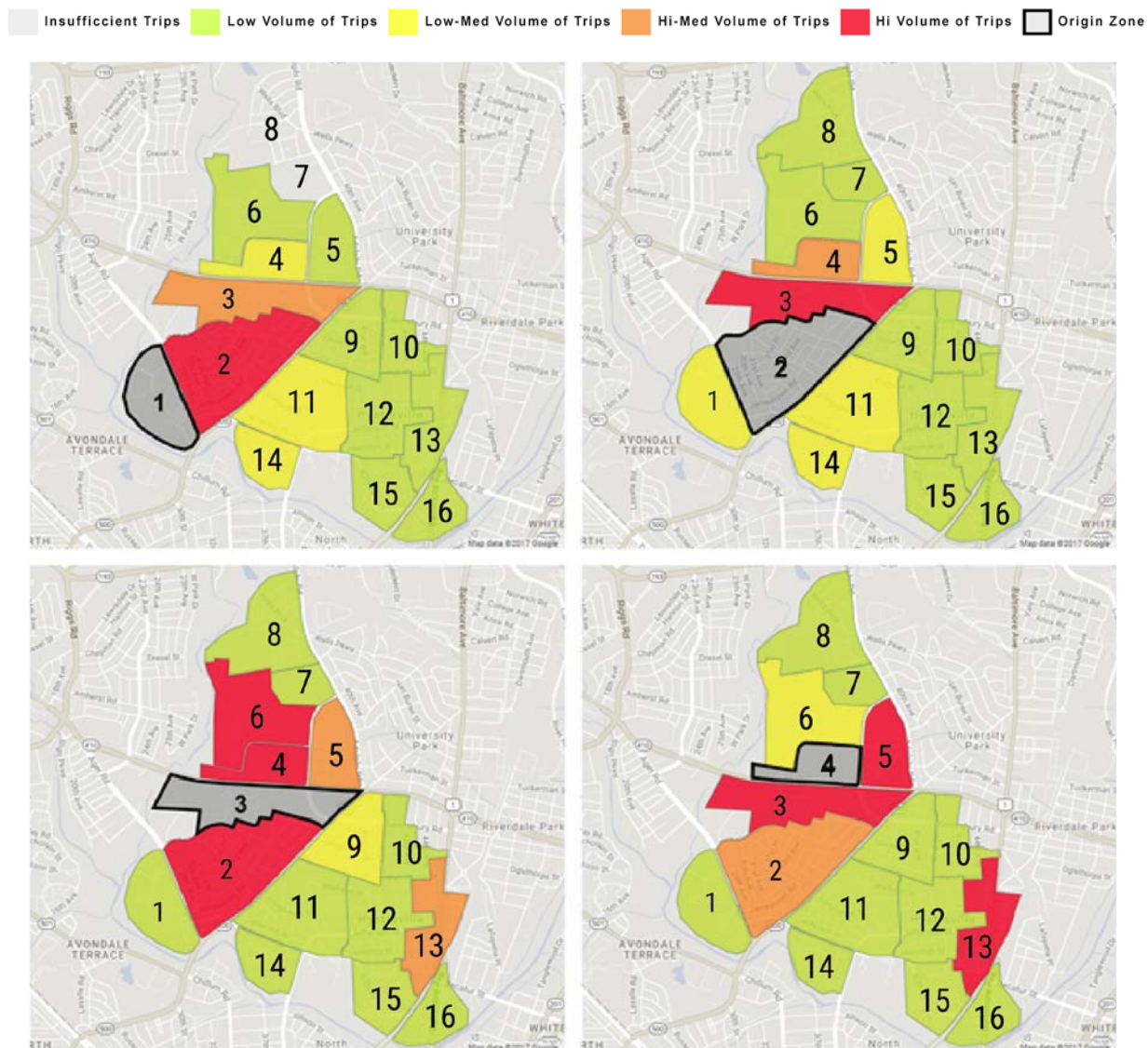
Table 13: Average Destination Rates

	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%

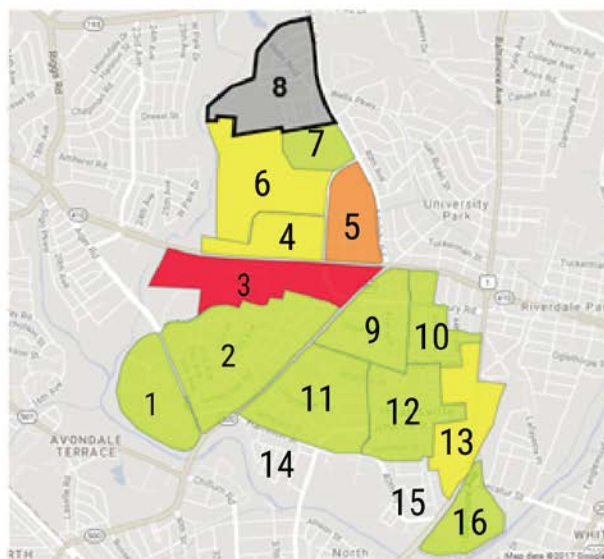
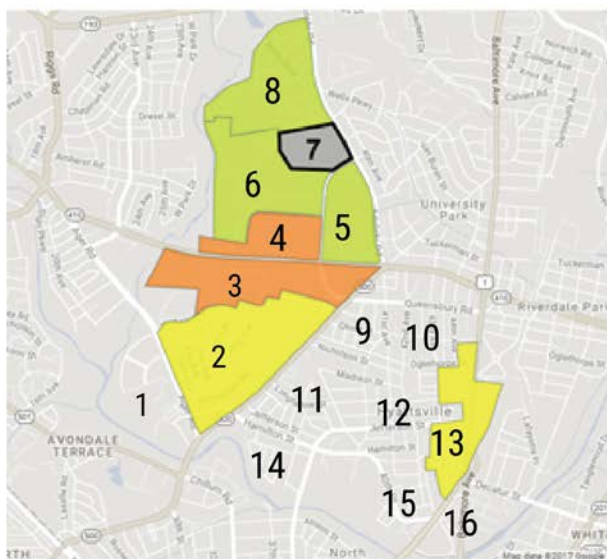
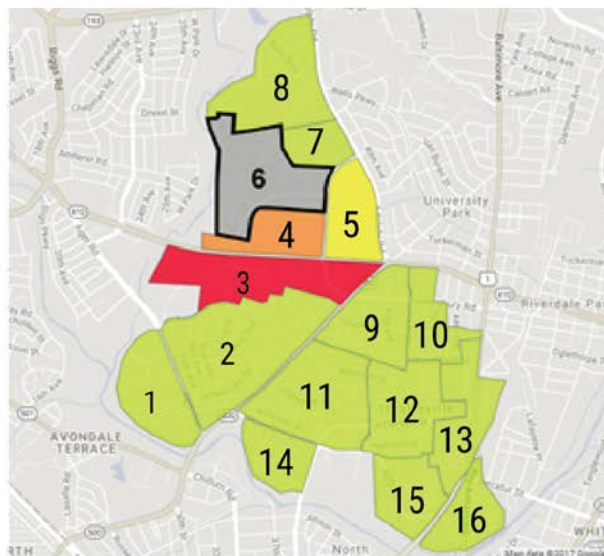
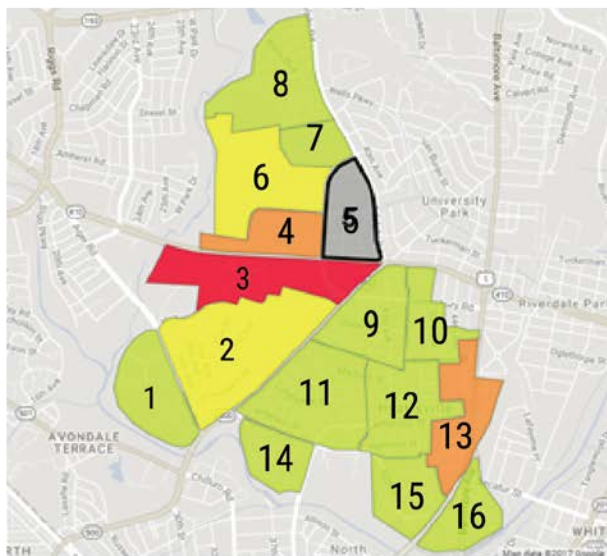
Local Results:

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.

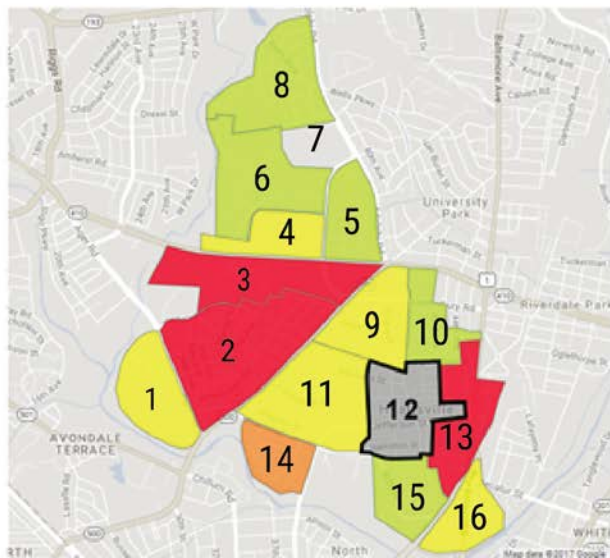
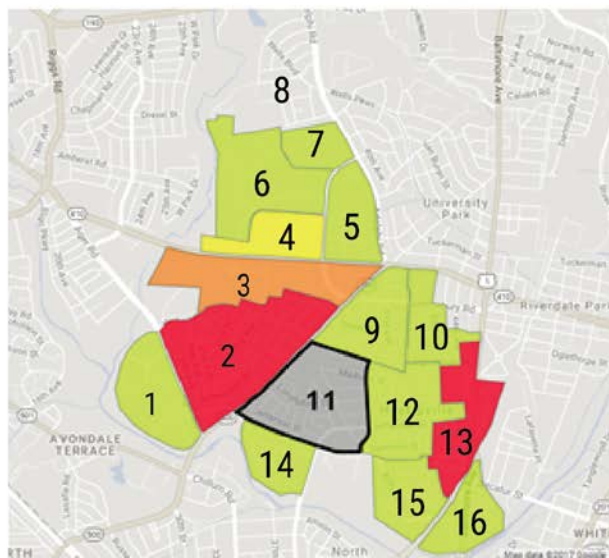
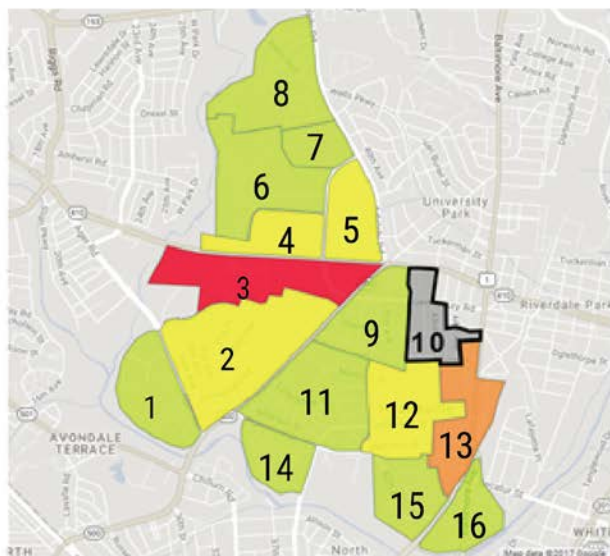
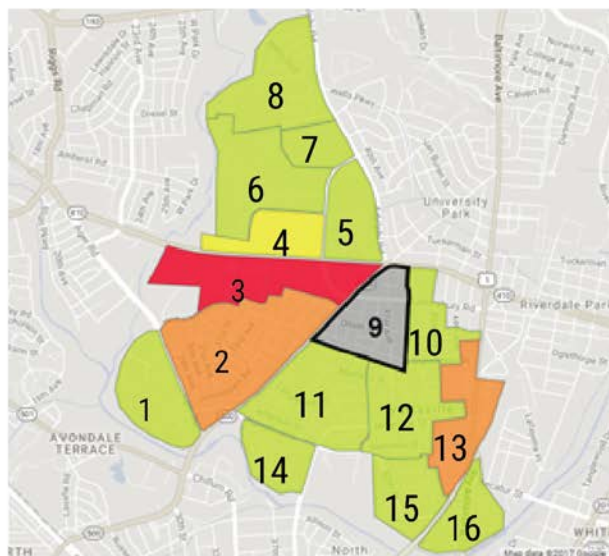
Figure 41: Proportion of Trips Originating in a Zone (bold) that Ended in Another Zone

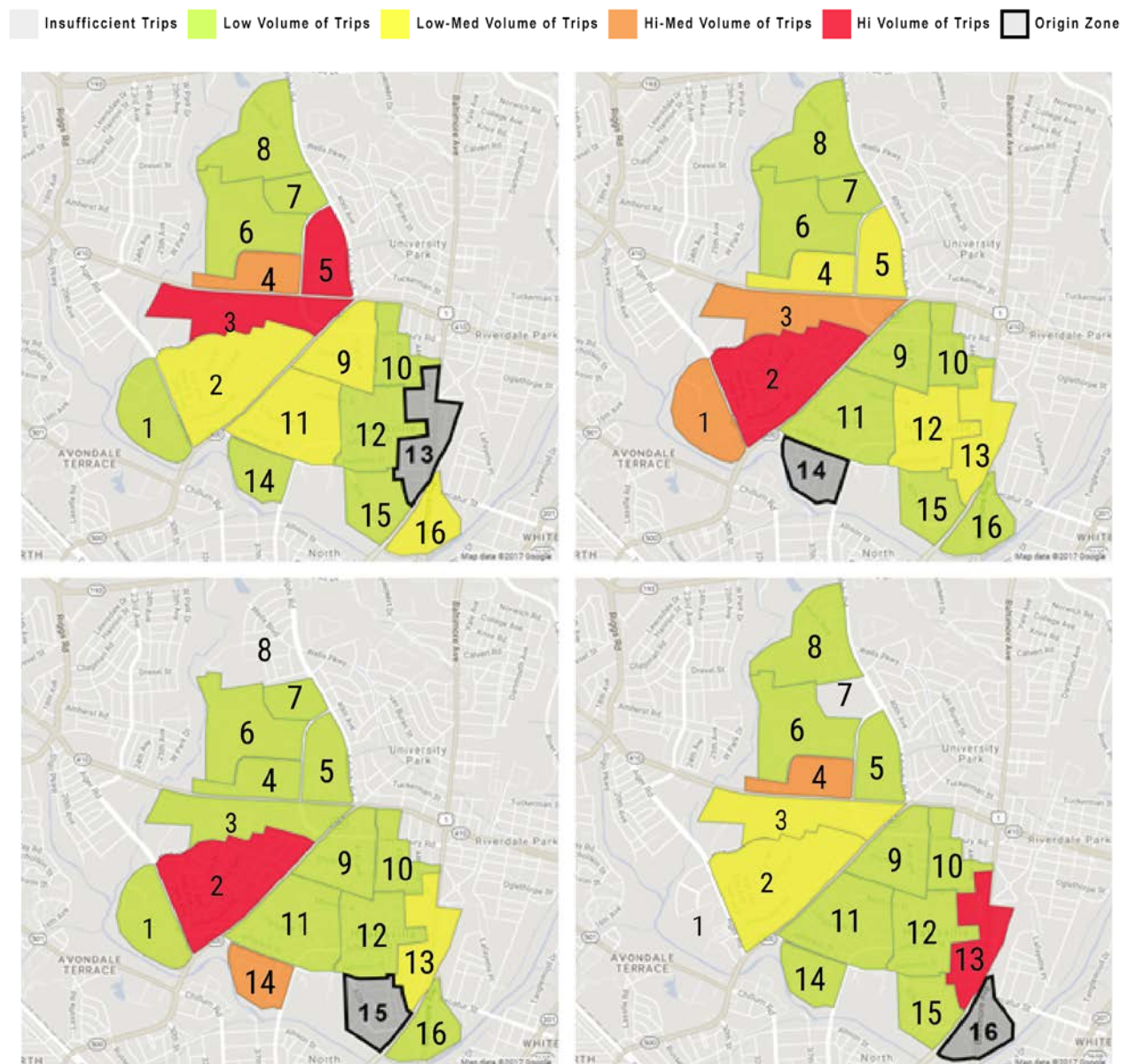


Insufficient Trips
 Low Volume of Trips
 Low-Med Volume of Trips
 Hi-Med Volume of Trips
 Hi Volume of Trips
 Origin Zone



Insufficient Trips
 Low Volume of Trips
 Low-Med Volume of Trips
 Hi-Med Volume of Trips
 Hi Volume of Trips
 Origin Zone





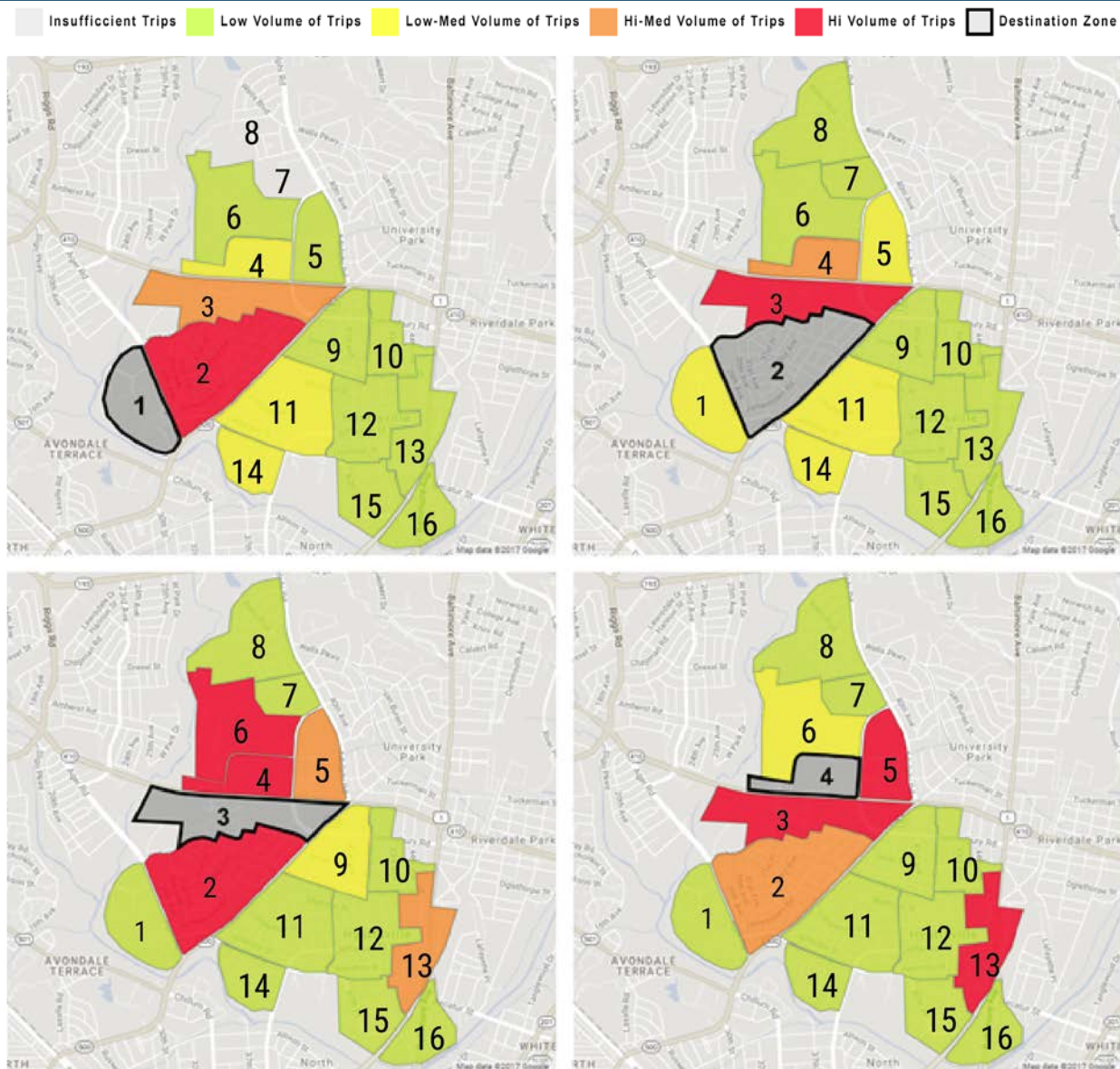
The data shows that a vast number of contiguous zones within the city receive the highest proportion of trips between each other. These are short trips that can potentially be made by walking or biking. The data also indicates that the most common destinations in the City are Zones 2, 3, 4, 5, and 13. 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)

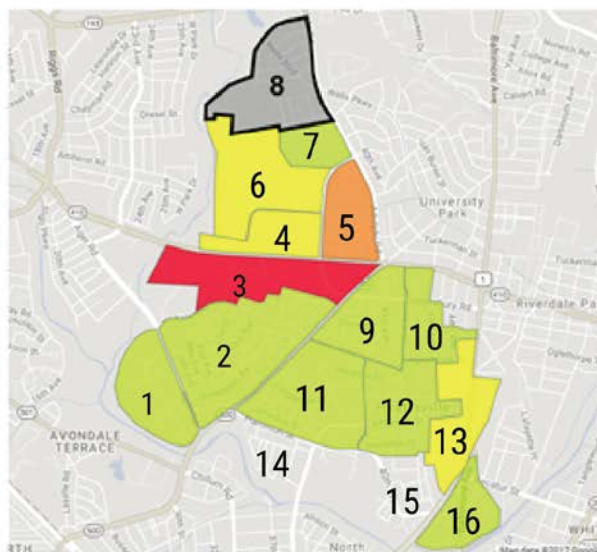
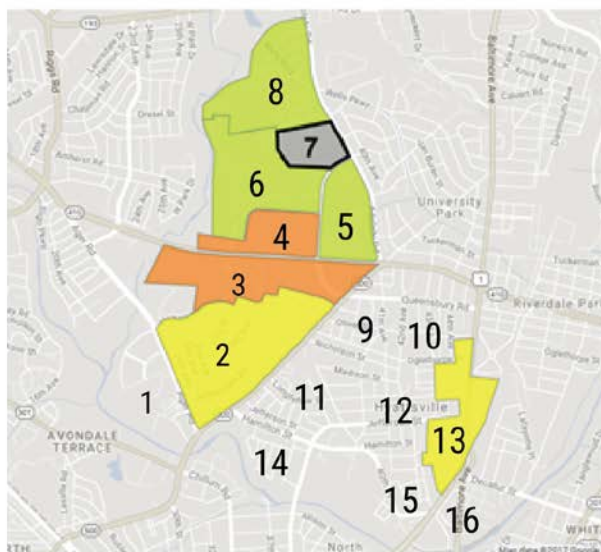
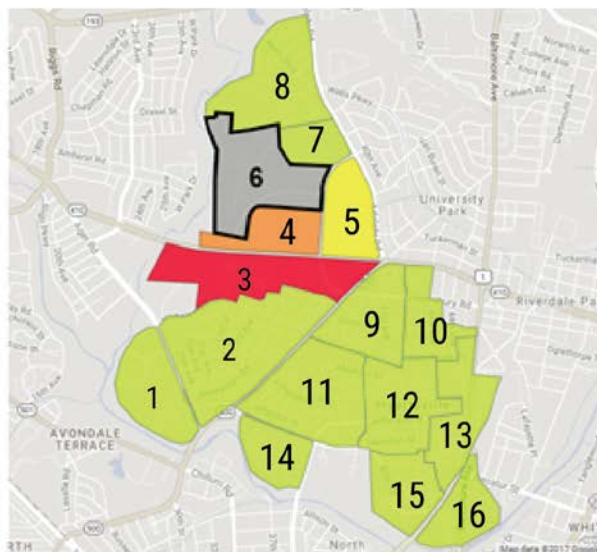
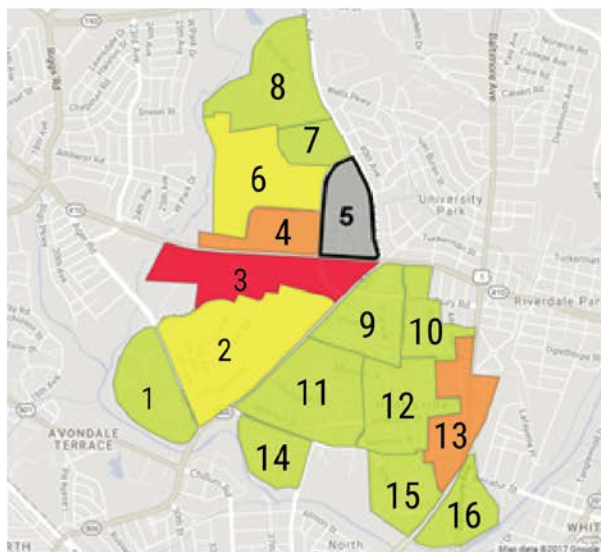
Destination Maps

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.

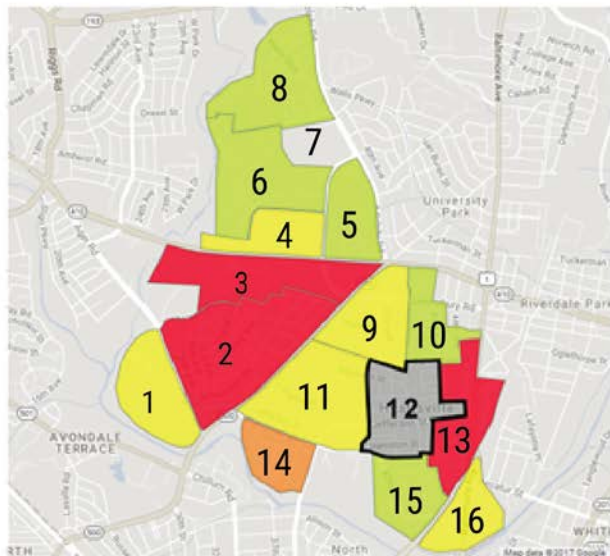
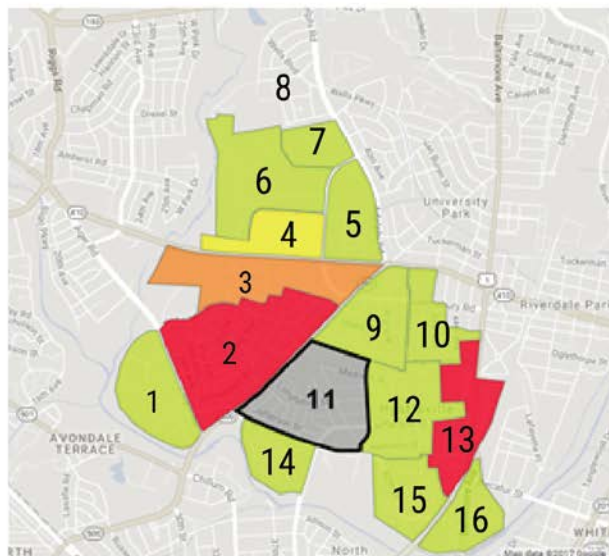
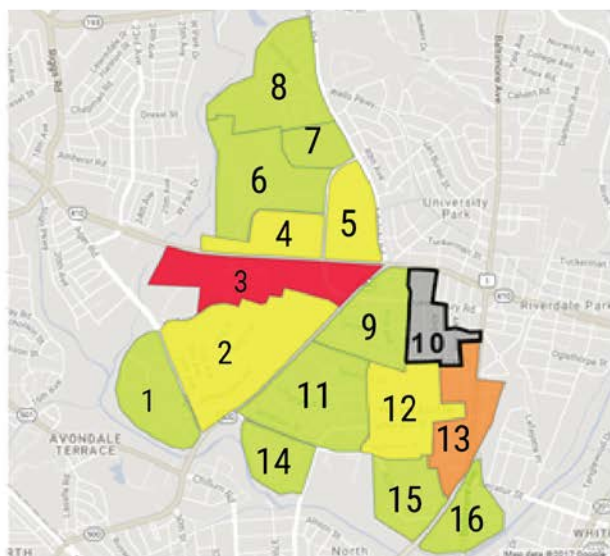
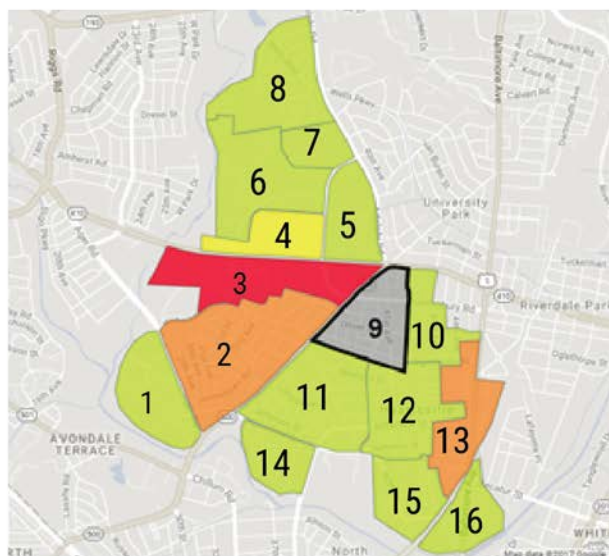
Figure 42: Proportion of Trips Ending in a Zone (bold) that Originated in Another Zone (colored)



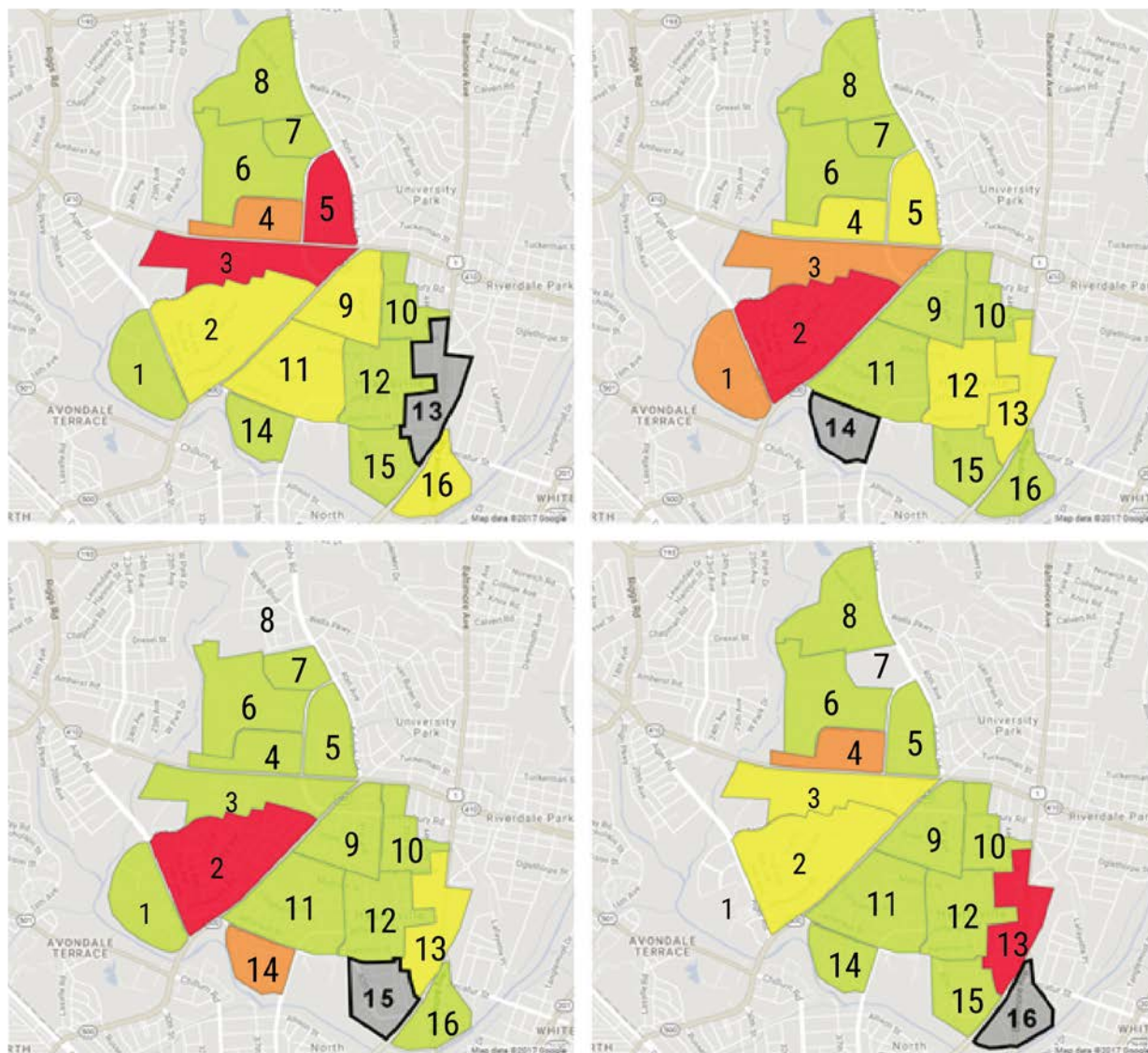
Insufficient Trips
 Low Volume of Trips
 Low-Med Volume of Trips
 Hi-Med Volume of Trips
 Hi Volume of Trips
 Destination Zone



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 its 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 95th-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

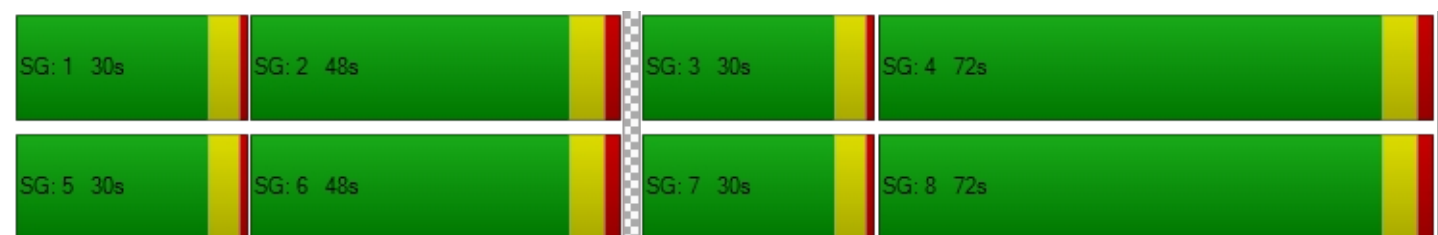
X, volume / capacity	0.84	0.62	0.62	0.53	1.01	1.02	0.88	1.04	1.05	0.91	0.75	0.50
d, Delay for Lane Group [s/veh]	61.95	61.39	61.62	44.91	112.59	114.31	86.21	89.99	105.29	106.32	50.49	43.96
Lane Group LOS	E	E	E	D	F	F	F	F	F	F	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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/Crittendon 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

[illegible]

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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 46s

SG: 5 74s

SG: 105 15s

SG: 6 46s

SG: 106 15s

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
 Analysis Method: HCM 2010
 Analysis Period: 15 minutes

Delay (sec / veh): 46.4
 Level Of Service: D
 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

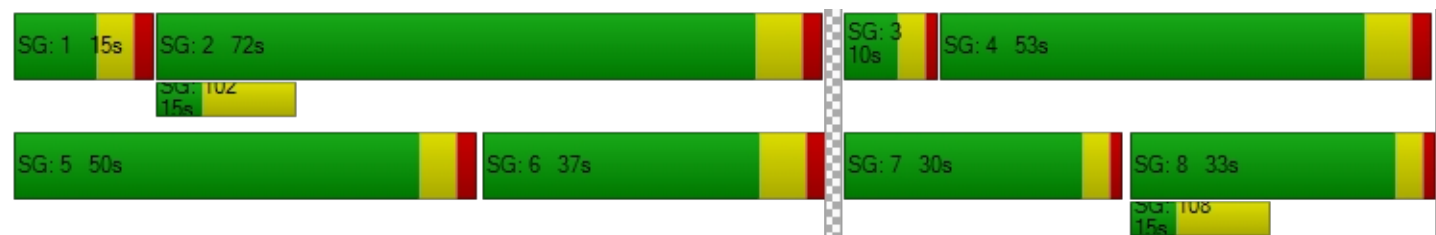
X, volume / capacity	0.56	0.64	1.13	0.88	0.52	0.07	0.21	0.68	0.76	0.83	0.42
d, Delay for Lane Group [s/veh]	89.53	52.24	144.05	69.74	40.85	34.50	28.49	43.52	30.13	38.74	2.51
Lane Group LOS	F	D	F	E	D	C	C	D	C	D	A
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

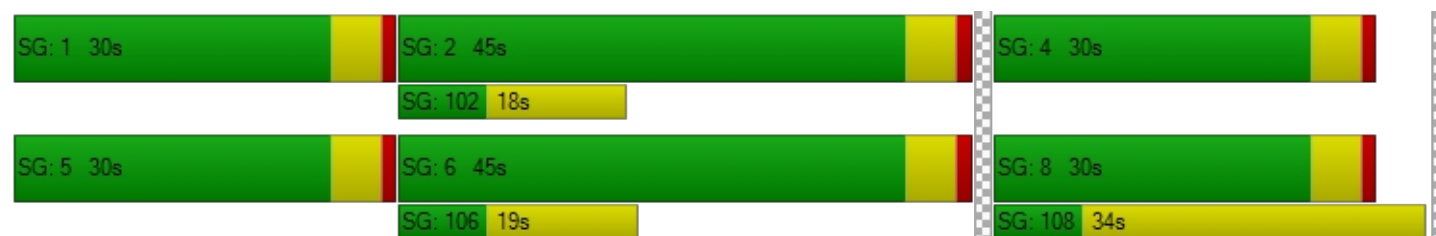
d_M, Delay for Movement [s/veh]	35.24	35.24	35.24	33.02	33.02	33.02	9.05	47.89	48.10	14.95	32.41	32.42
Movement LOS	D	D	D	C	C	C	A	D	D	B	C	C
d_A, Approach Delay [s/veh]	35.24			33.02			47.01			29.95		
Approach LOS	D			C			D			C		
d_I, Intersection Delay [s/veh]	39.24											
Intersection LOS	D											
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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

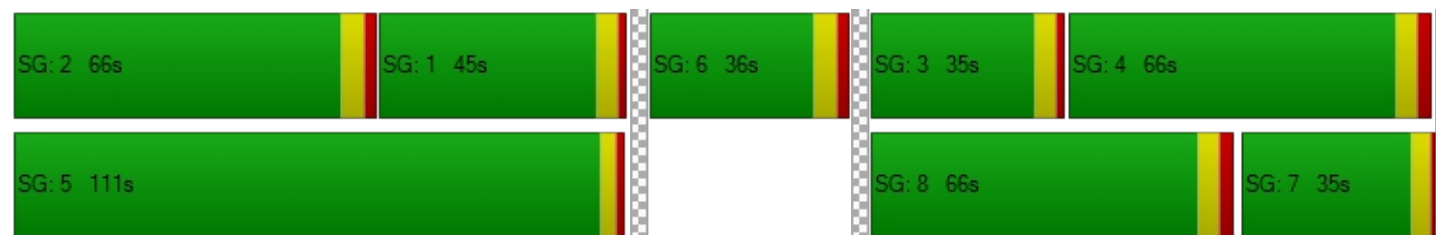
X, volume / capacity	0.88	0.75	0.20	0.14	0.69	0.21	0.68	0.75	0.74	0.54
d, Delay for Lane Group [s/veh]	57.61	39.45	32.24	16.82	15.80	38.59	46.44	59.89	59.82	55.11
Lane Group LOS	E	D	C	B	B	D	D	E	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.96	9.46	1.93	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		

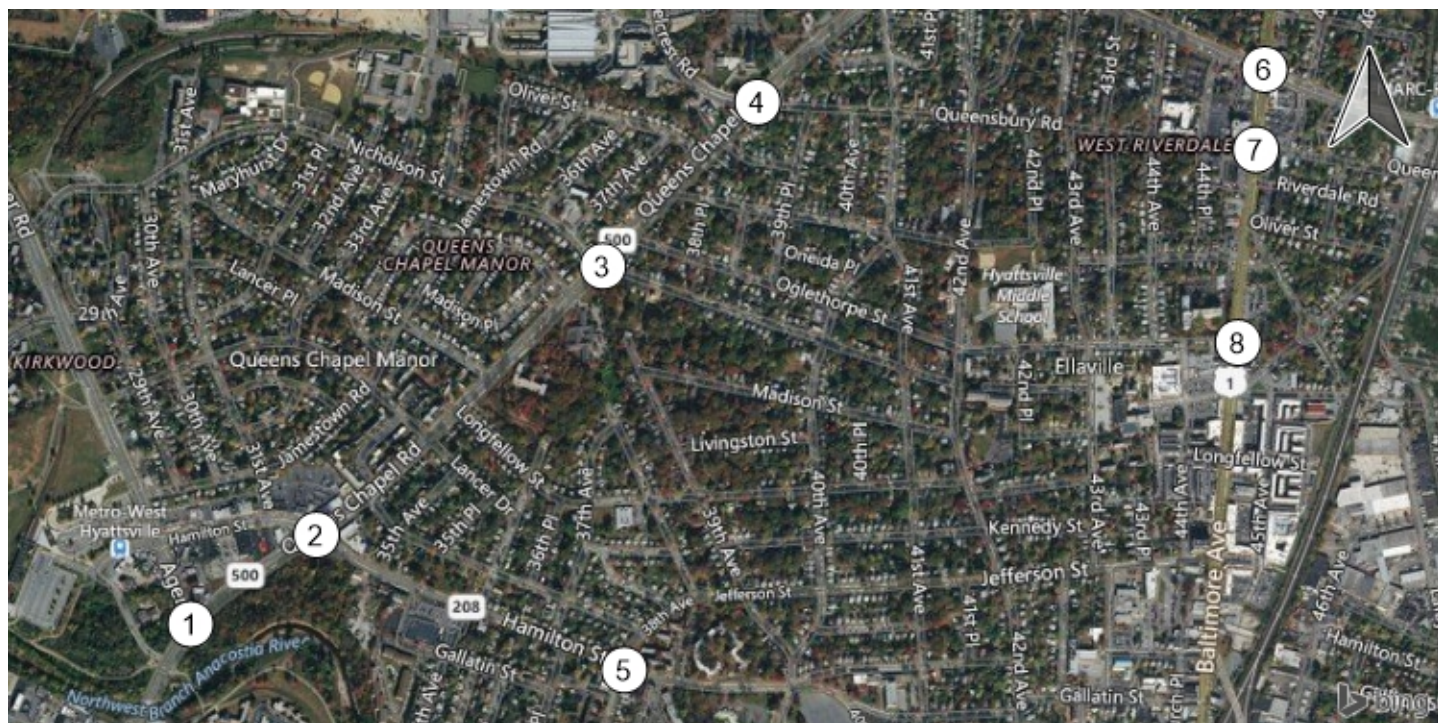
Intersection Settings

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

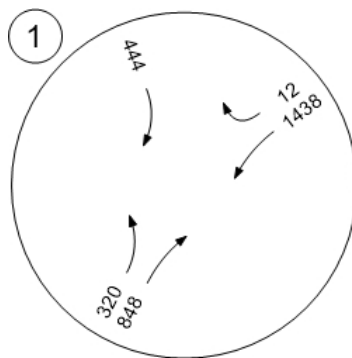
Movement, Approach, & Intersection Results

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											

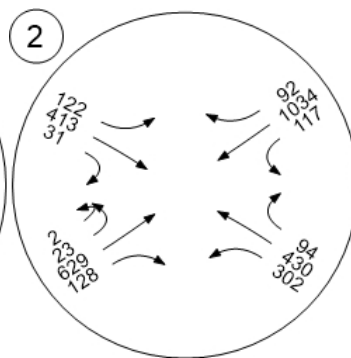
Traffic Volume - Future Total Volume



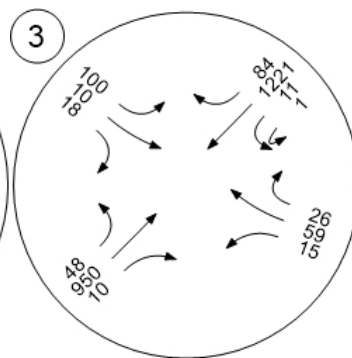
MD 500/Ager Rd



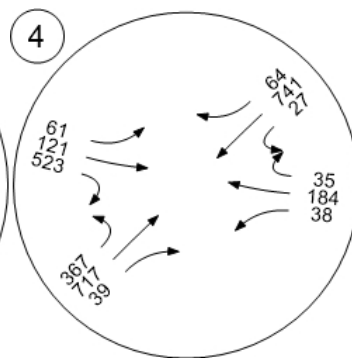
MD 500/Hamilton St



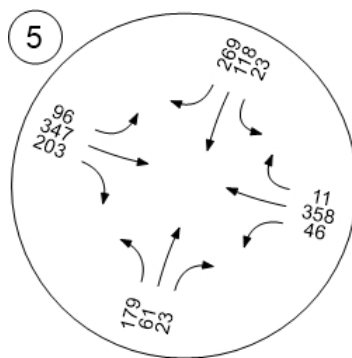
MD 500/Nicholson St



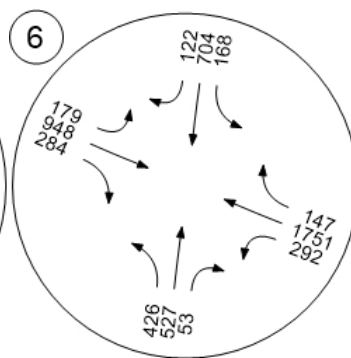
MD 500/Belcrest Rd/Queens



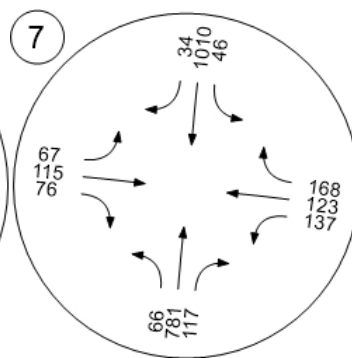
MD 208(Hamilton St)/38th Av



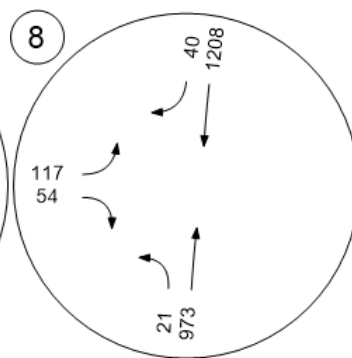
US 1/MD 410



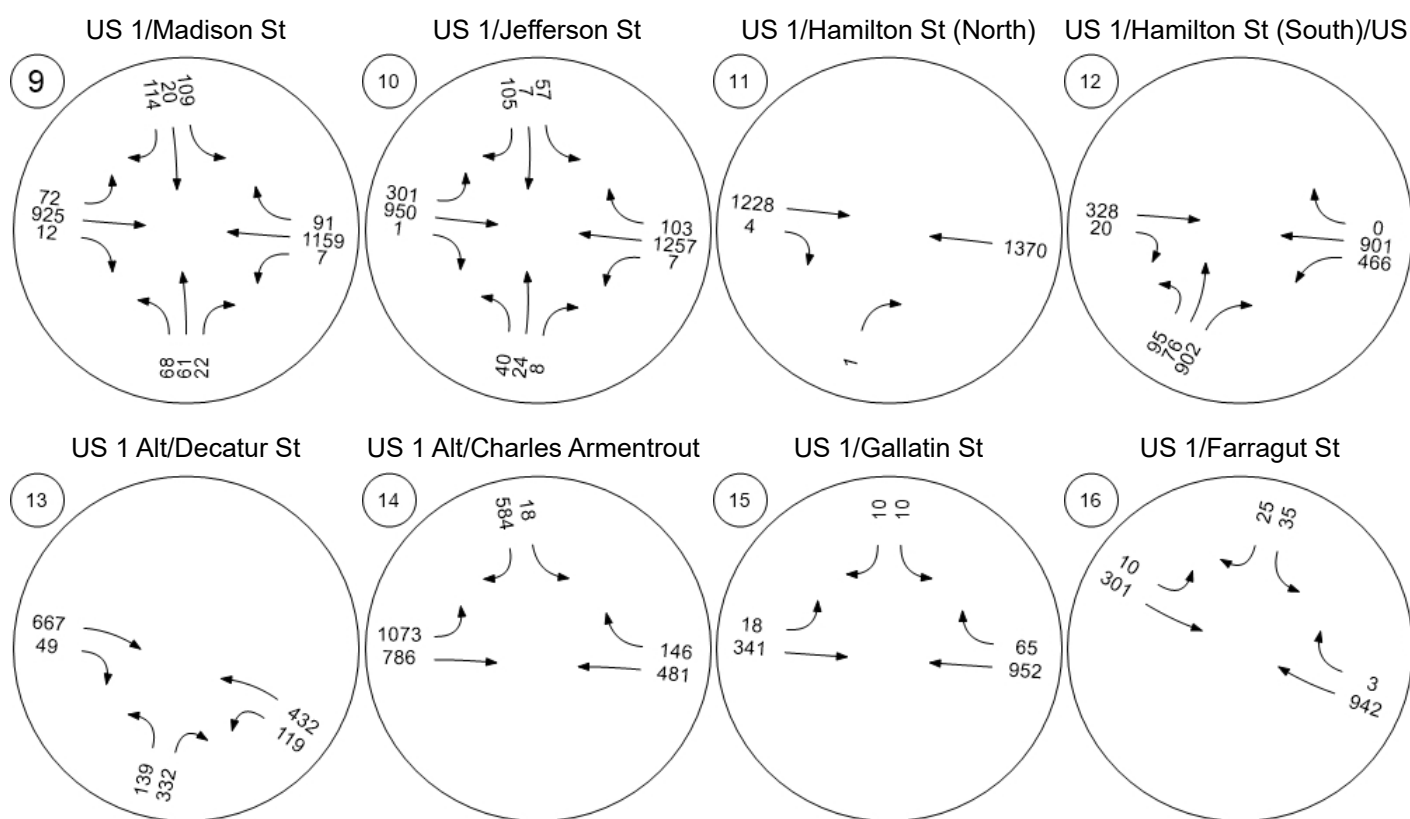
US 1/Queensbury Rd



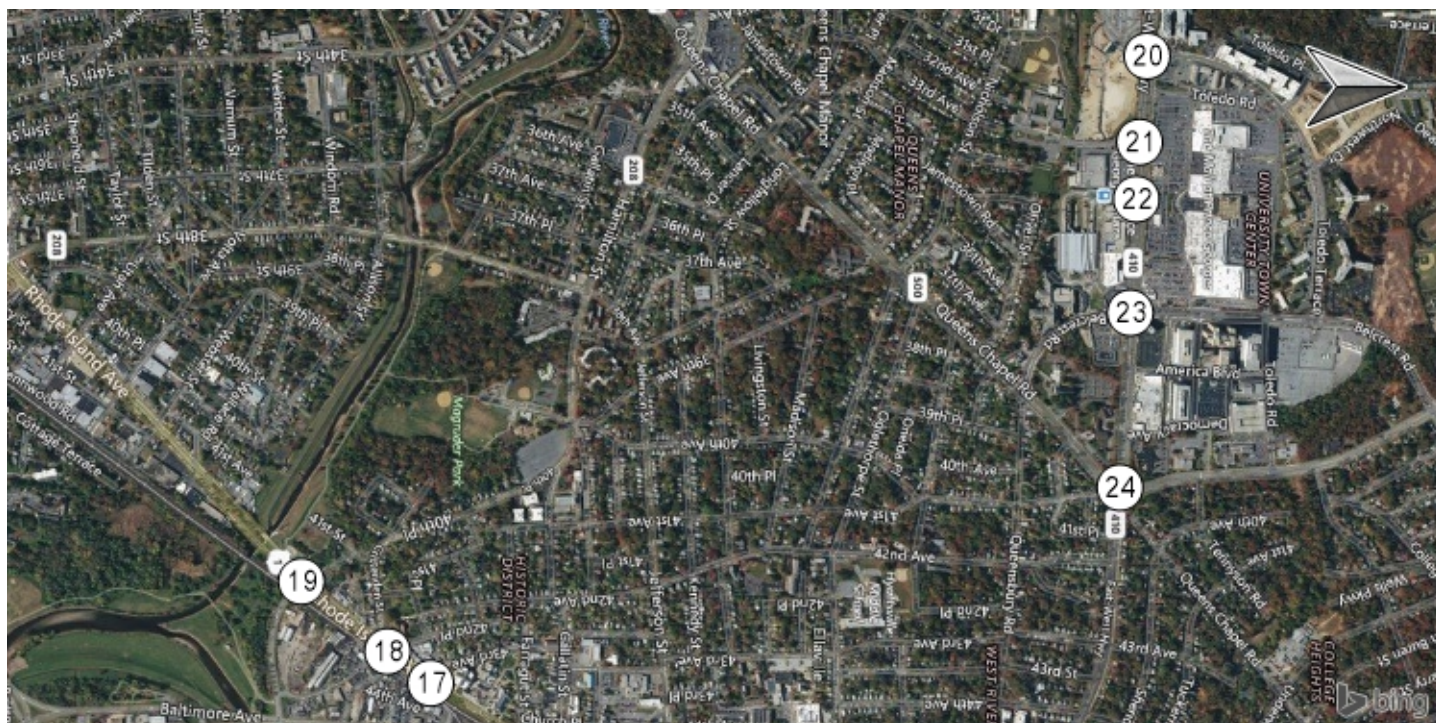
US 1/Oglethorpe Rd



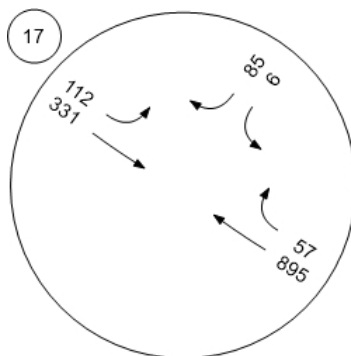
Traffic Volume - Future Total Volume



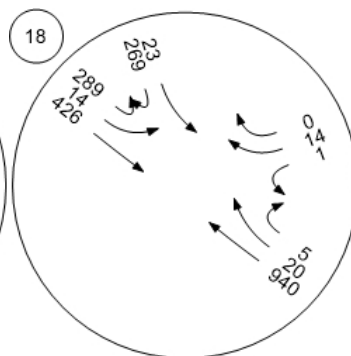
Traffic Volume - Future Total Volume



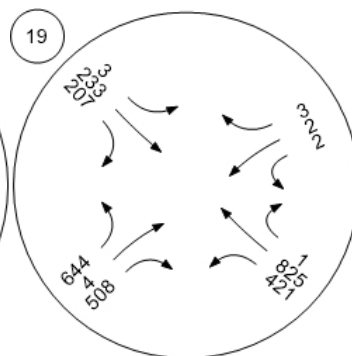
US 1/43rd Avenue



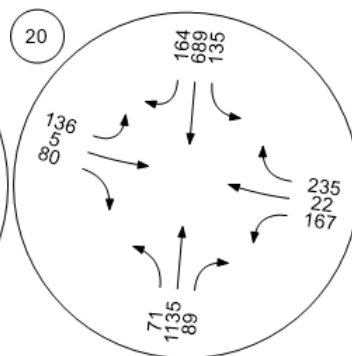
US 1/42nd Place/Crittendon



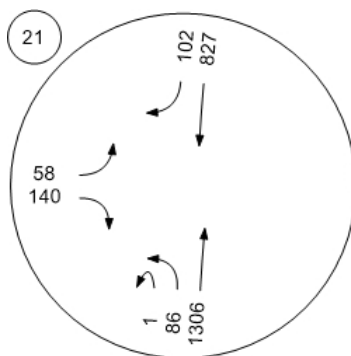
US 1/41st Place/Charles Arm



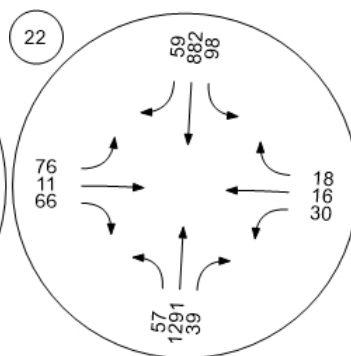
MD 410/Toledo Terrace



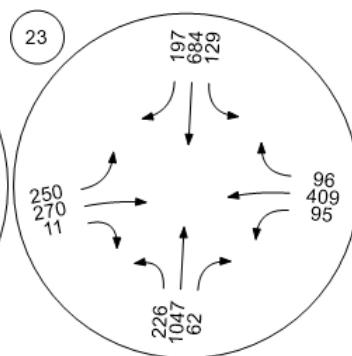
MD 410/Editors Park Dr



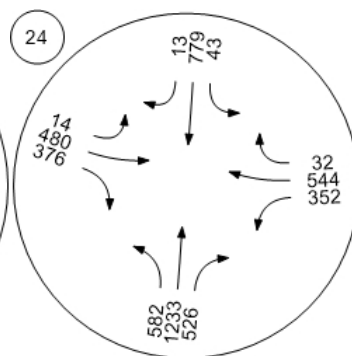
MD 410/Prince George's Plaza



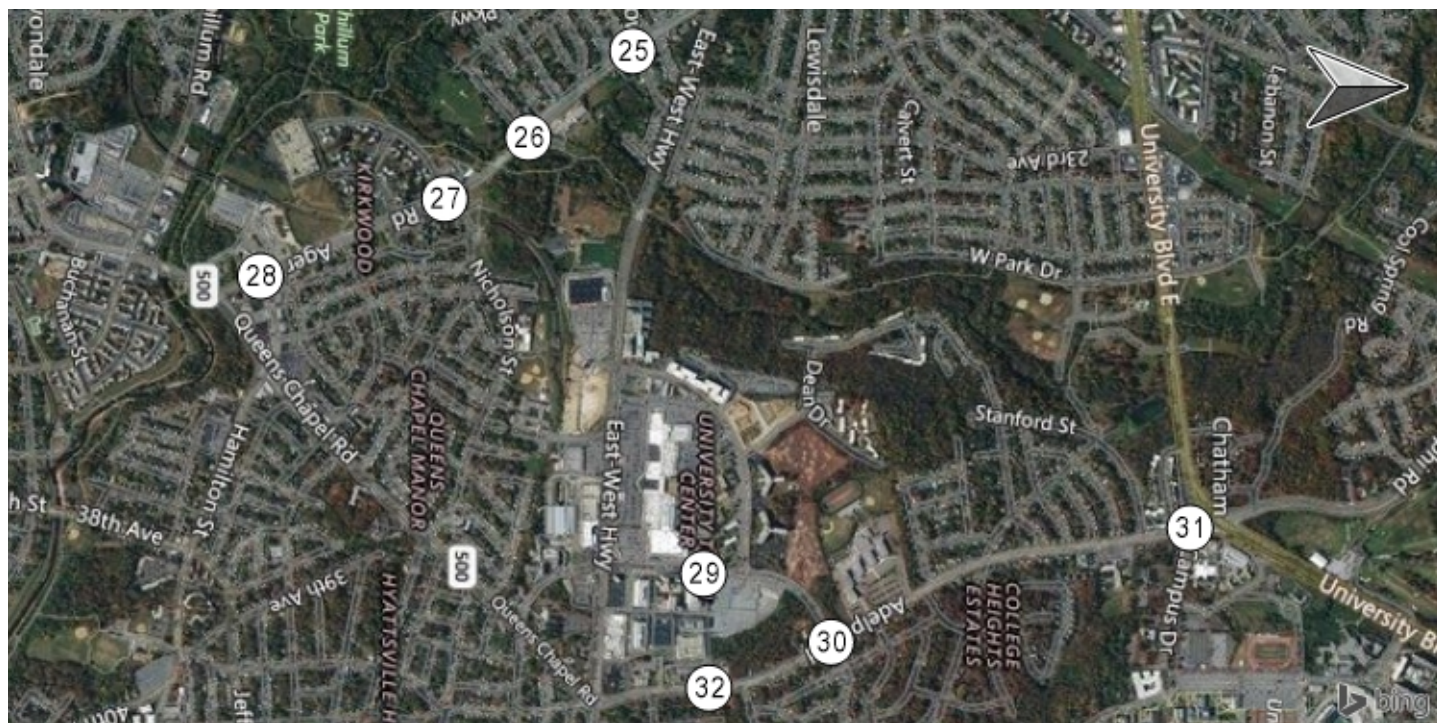
MD 410/Belcrest Rd



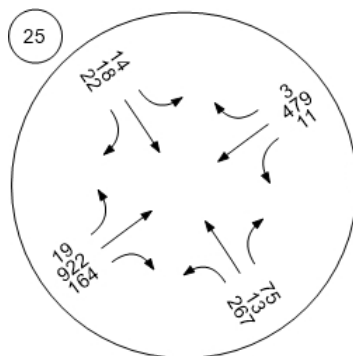
MD 410/MD 500/Adelphi Rd



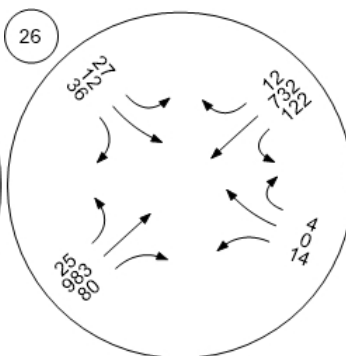
Traffic Volume - Future Total Volume



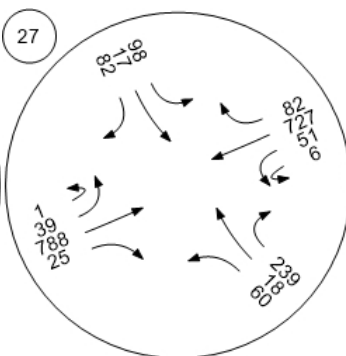
Ager Rd/23rd Ave



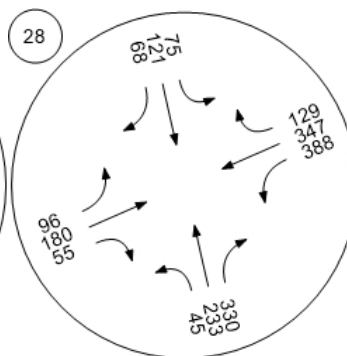
Ager Rd/Oglethorpe St/Scho



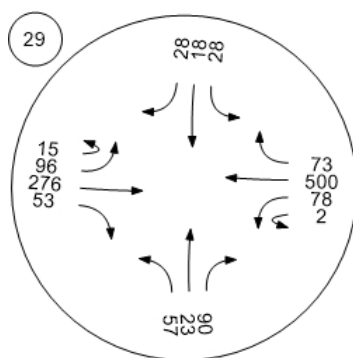
Ager Rd/Nicholson St



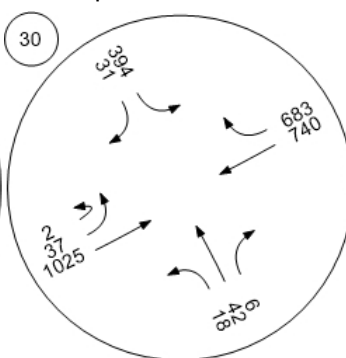
Ager Rd/Hamilton St



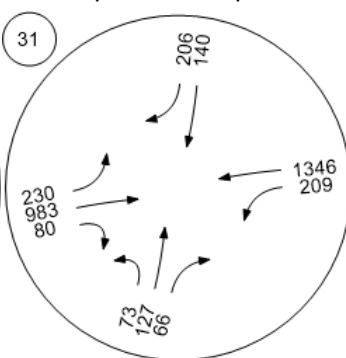
Toledo Rd/Belcrest Rd



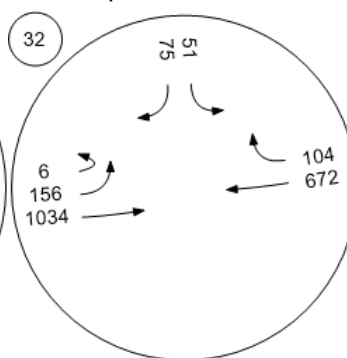
Adelphi Rd/Belcrest Rd



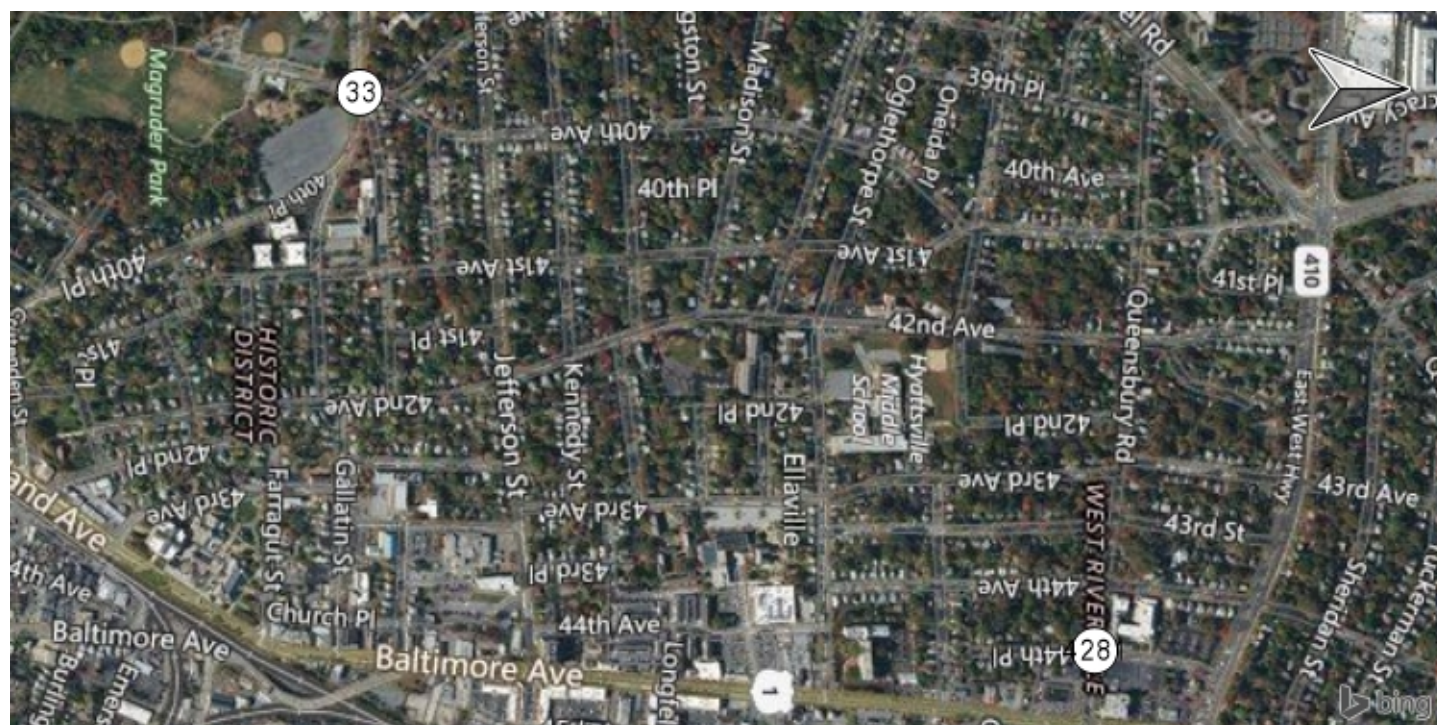
Adelphi Rd/Campus Dr



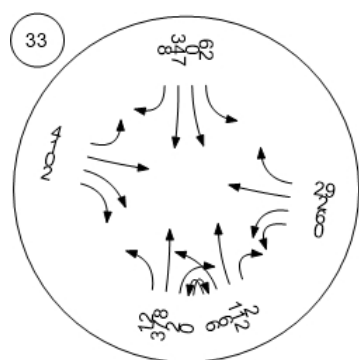
Adelphi Rd/Toledo Rd



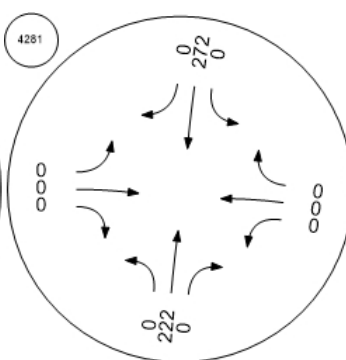
Traffic Volume - Future Total Volume



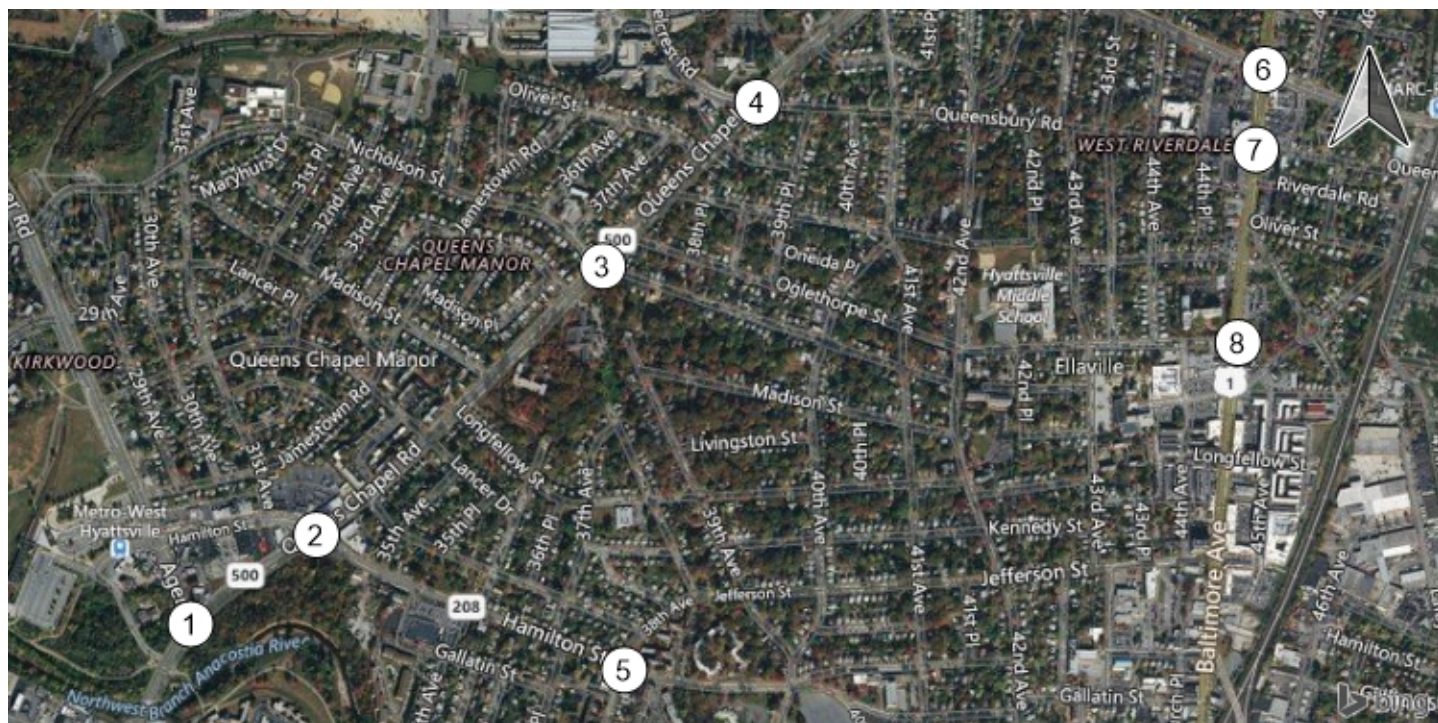
Hamilton St/40th Pl/39th Ave



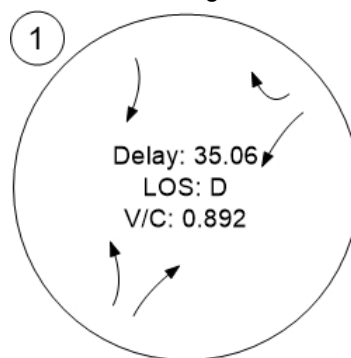
New Intersection



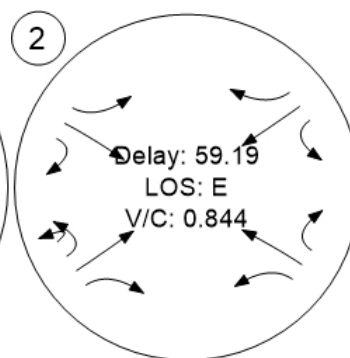
Traffic Conditions



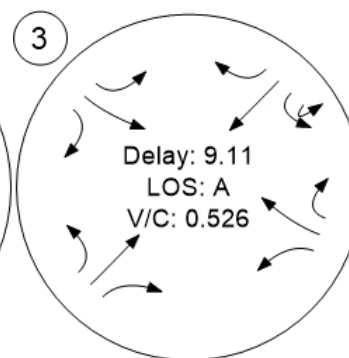
MD 500/Ager Rd



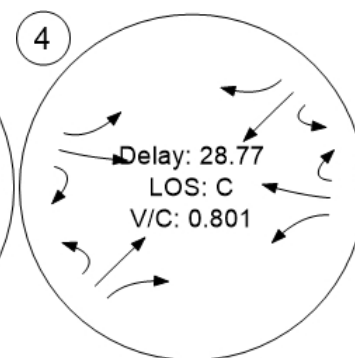
MD 500/Hamilton St



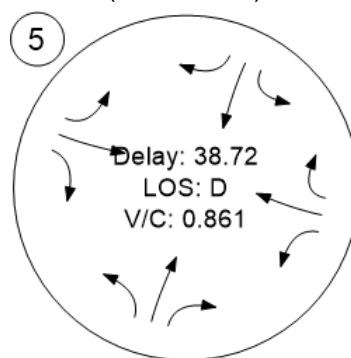
MD 500/Nicholson St



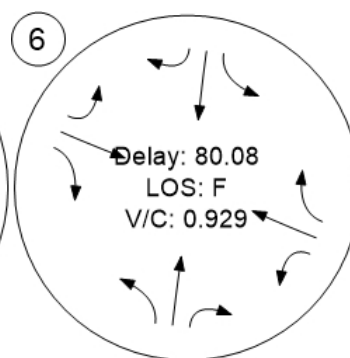
MD 500/Belcrest Rd/Queens



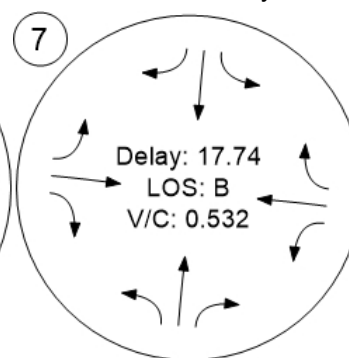
MD 208(Hamilton St)/38th Av



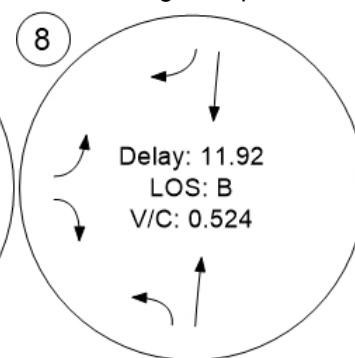
US 1/MD 410



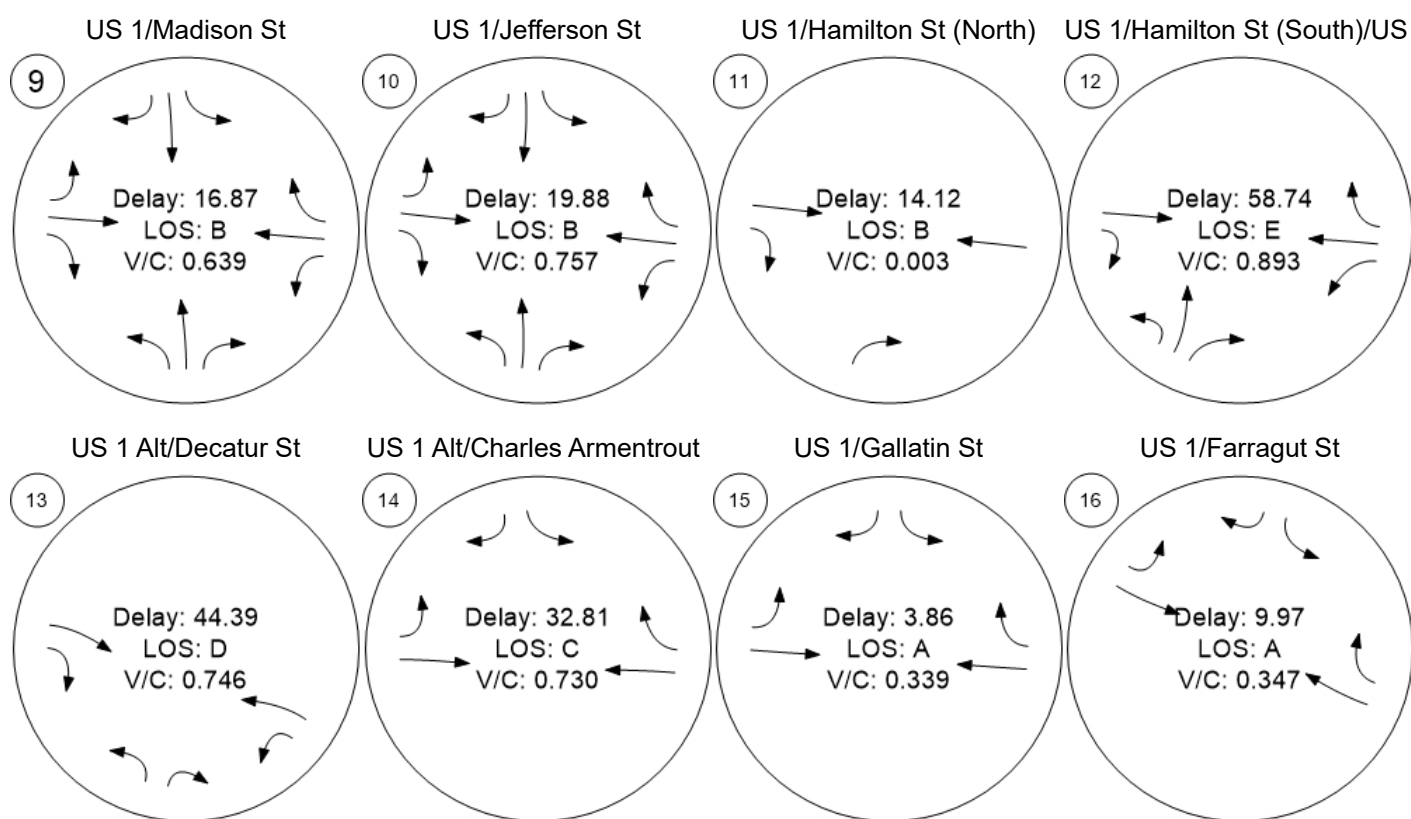
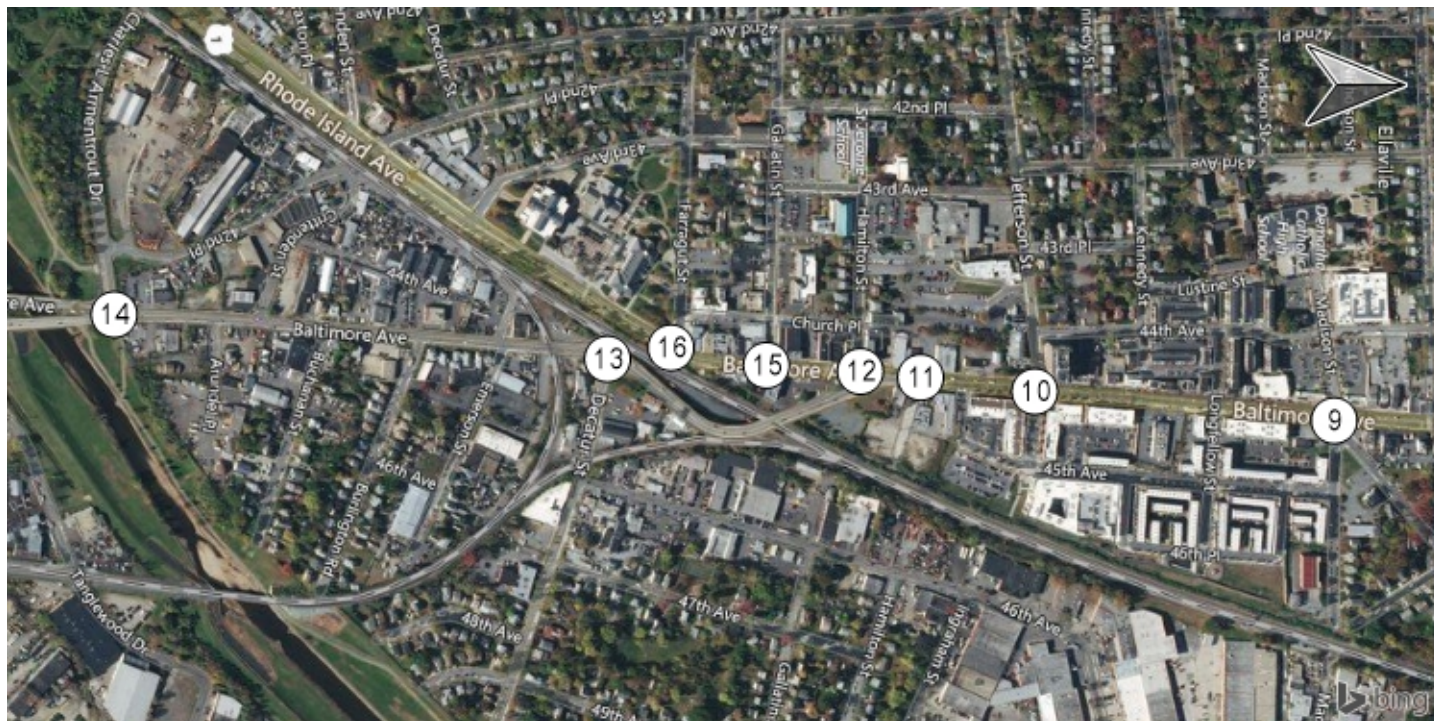
US 1/Queensbury Rd



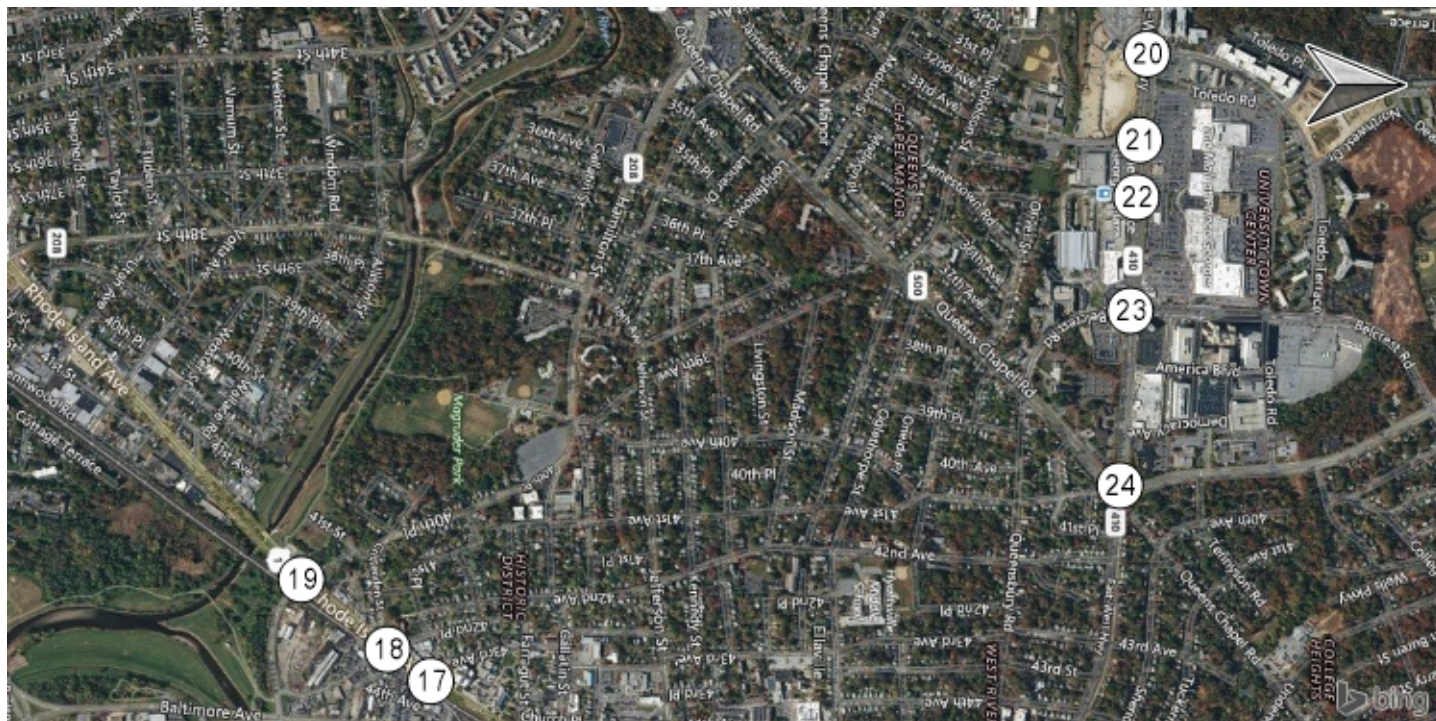
US 1/Oglethorpe Rd



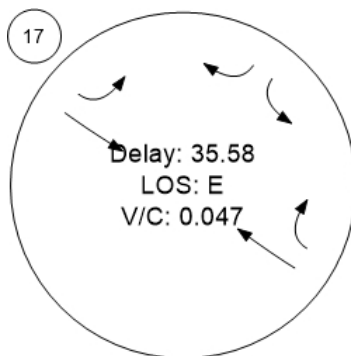
Traffic Conditions



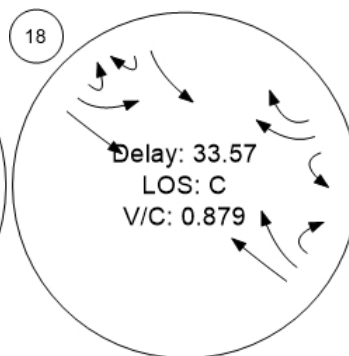
Traffic Conditions



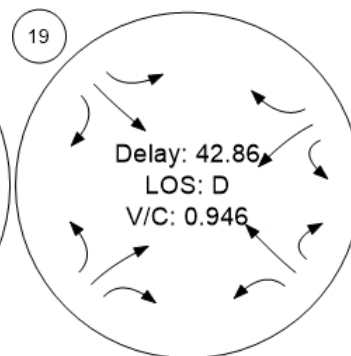
US 1/43rd Avenue



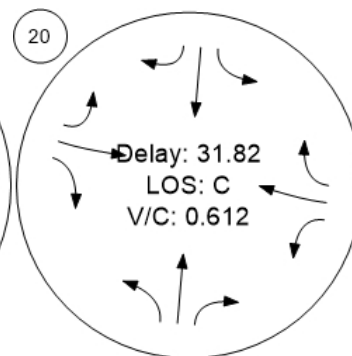
US 1/42nd Place/Crittendon



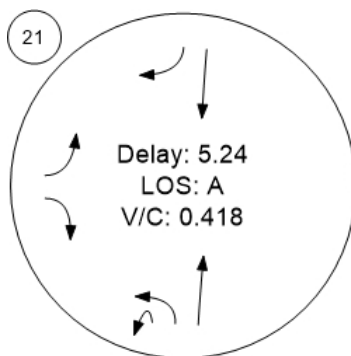
US 1/41st Place/Charles Arm



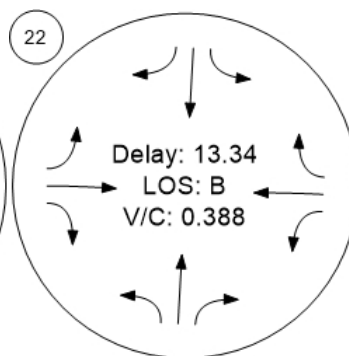
MD 410/Toledo Terrace



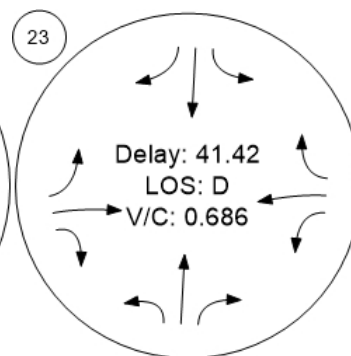
MD 410/Editors Park Dr



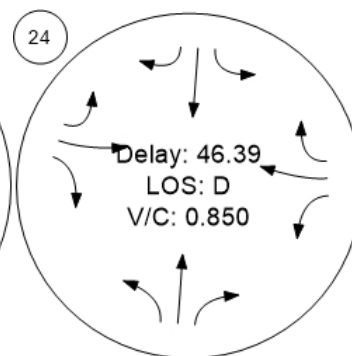
MD 410/Prince George's Plaz



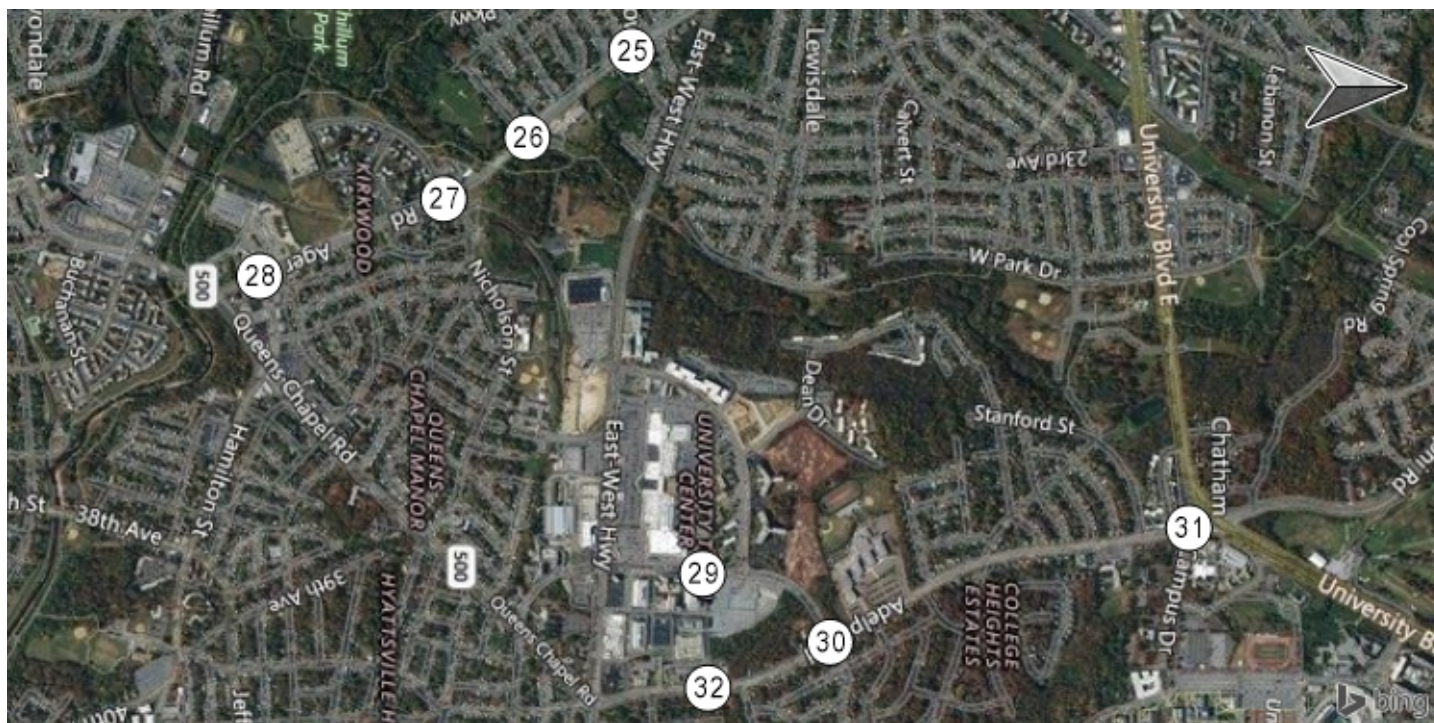
MD 410/Belcrest Rd



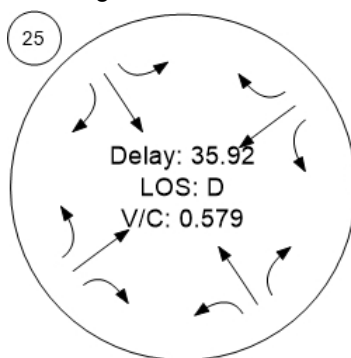
MD 410/MD 500/Adelphi Rd



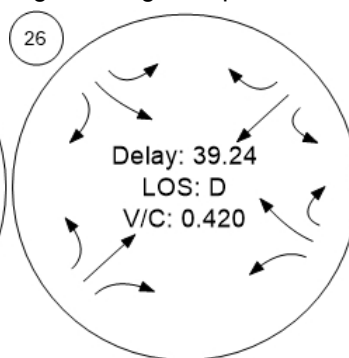
Traffic Conditions



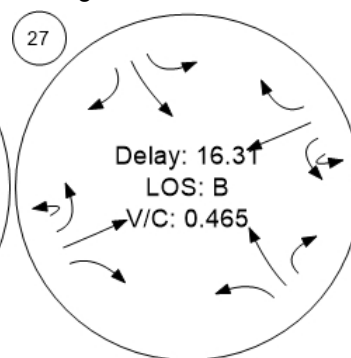
Ager Rd/23rd Ave



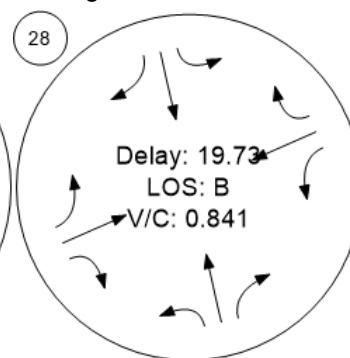
Ager Rd/Oglethorpe St/Scho



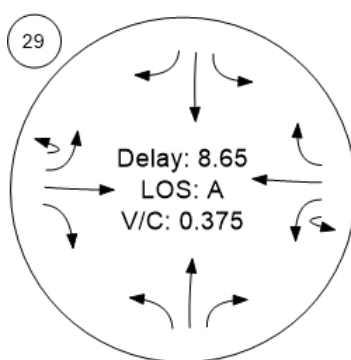
Ager Rd/Nicholson St



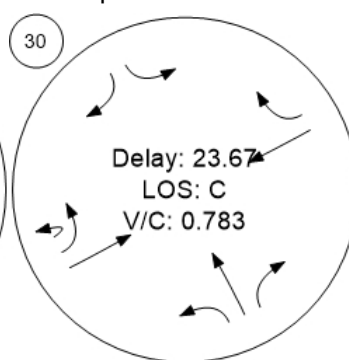
Ager Rd/Hamilton St



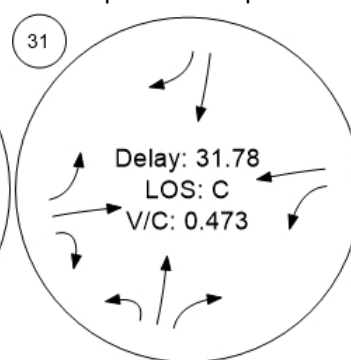
Toledo Rd/Belcrest Rd



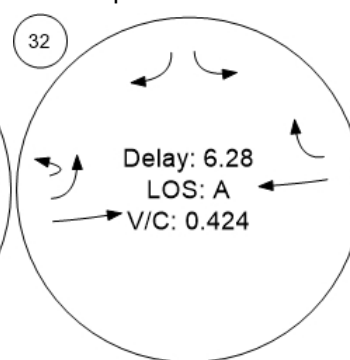
Adelphi Rd/Belcrest Rd



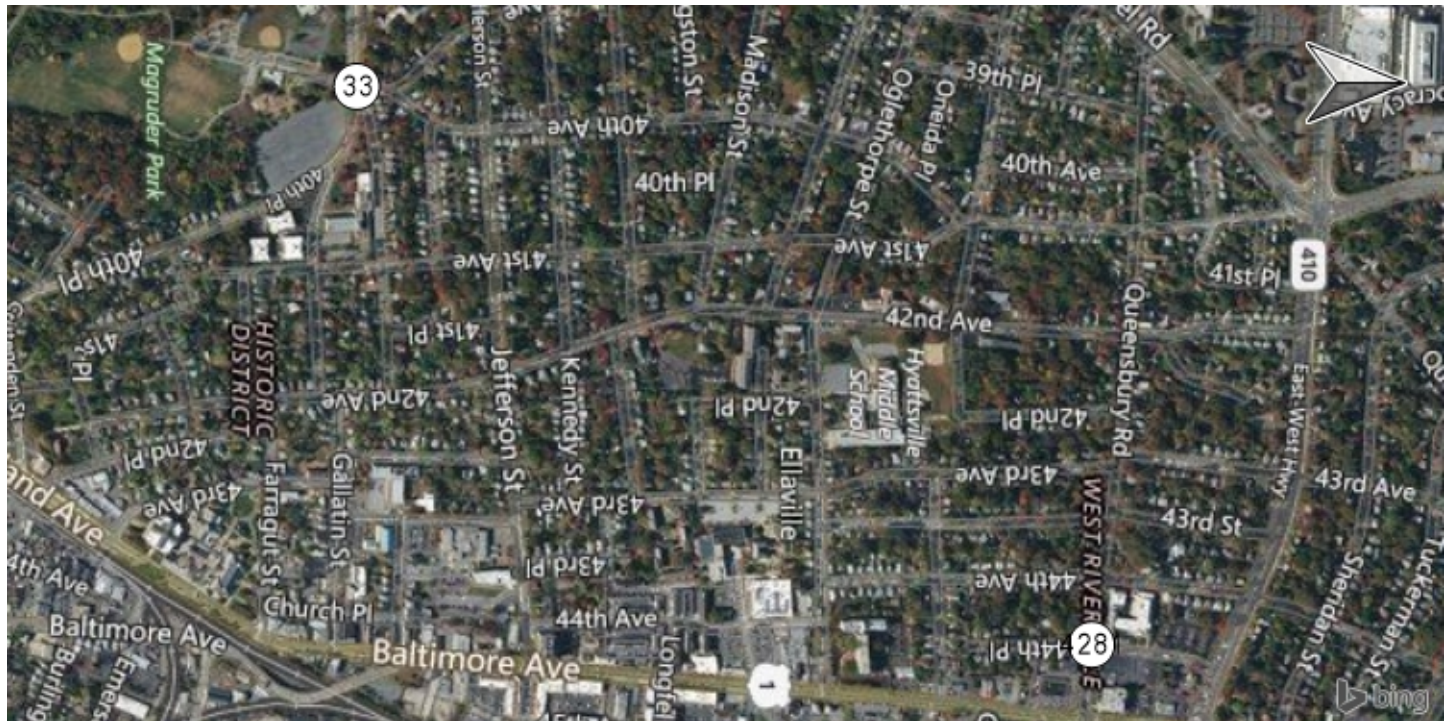
Adelphi Rd/Campus Dr



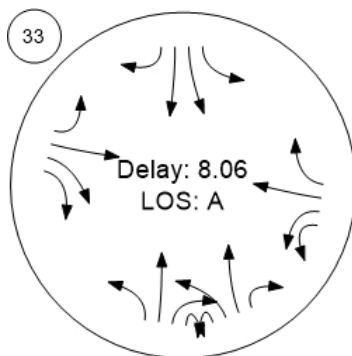
Adelphi Rd/Toledo Rd



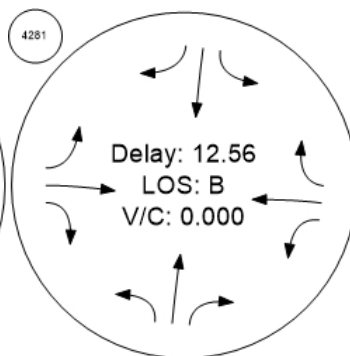
Traffic Conditions



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/Greenidge 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

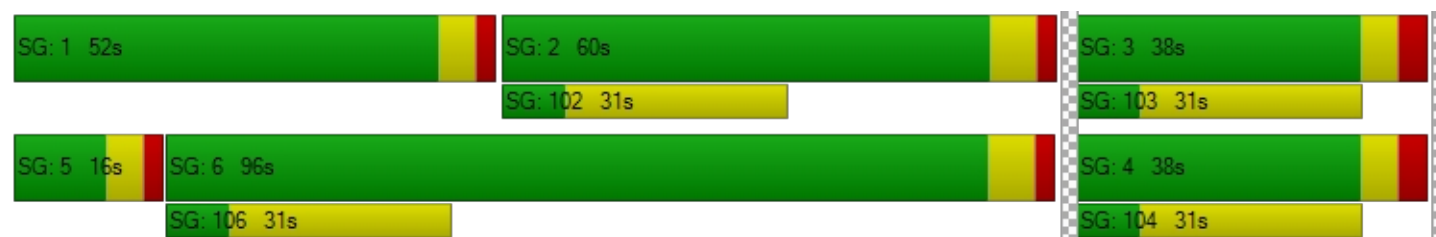
X, volume / capacity	0.36	0.28	0.58	0.41	0.53	0.53	0.06	0.65	0.65
d, Delay for Lane Group [s/veh]	37.93	24.89	28.46	11.64	18.12	18.19	9.07	24.65	24.77
Lane Group LOS	D	C	C	B	B	B	A	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.38	2.09	4.97	1.67	6.04	5.97	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	Delay (sec / veh):	38.7
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	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

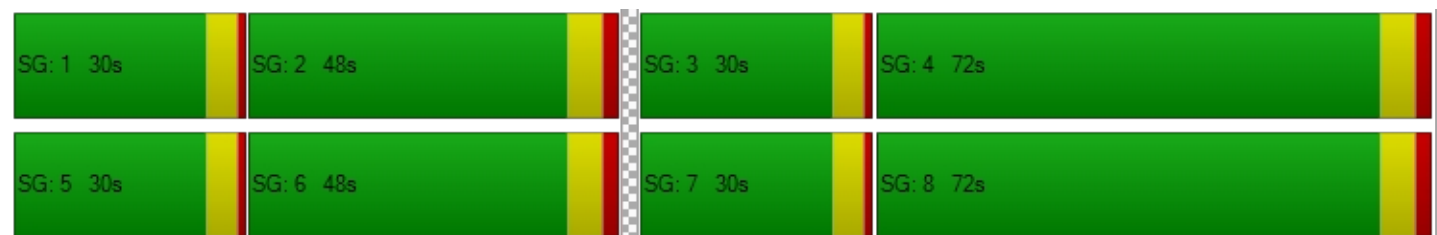
X, volume / capacity	0.85	0.62	0.62	0.53	1.03	1.04	0.96	0.92	0.54	1.32	1.09	1.11
d, Delay for Lane Group [s/veh]	62.33	61.66	61.90	45.20	118.54	120.45	118.84	66.63	49.10	245.09	109.73	125.63
Lane Group LOS	E	E	E	D	F	F	F	E	D	F	F	F
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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): 0.649

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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 90s

SG: 4 30s

SG: 102 15s

SG: 104 15s

SG: 6 90s

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	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	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

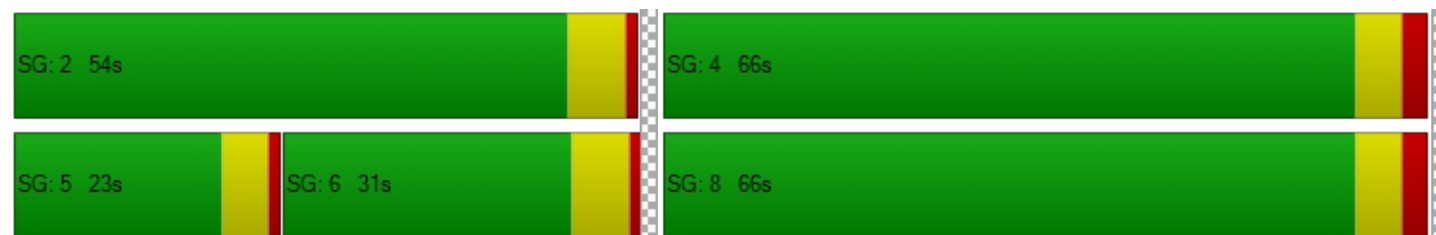
X, volume / capacity	0.05	0.35	0.70	0.81	0.63	0.63	0.92	0.89	0.01
d, Delay for Lane Group [s/veh]	61.57	41.94	55.77	42.98	32.75	32.75	46.22	50.97	15.06
Lane Group LOS	E	D	E	D	C	C	D	D	B
Critical Lane Group	No	No	Yes	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.12	3.38	7.24	12.59	11.31	11.31	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

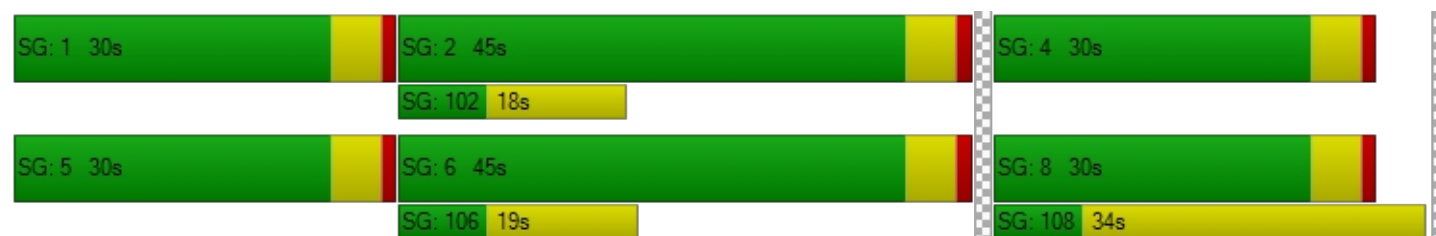
d_M, Delay for Movement [s/veh]	35.24	35.24	35.24	33.02	33.02	33.02	9.05	47.89	48.10	14.95	32.41	32.42
Movement LOS	D	D	D	C	C	C	A	D	D	B	C	C
d_A, Approach Delay [s/veh]	35.24			33.02			47.01			29.95		
Approach LOS	D			C			D			C		
d_I, Intersection Delay [s/veh]	39.24											
Intersection LOS	D											
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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

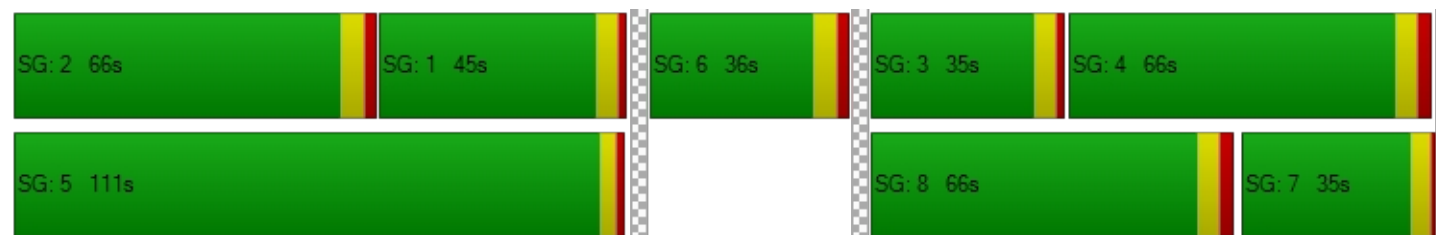
X, volume / capacity	0.88	0.75	0.20	0.14	0.69	0.21	0.68	0.75	0.74	0.54
d, Delay for Lane Group [s/veh]	57.61	39.45	32.24	16.82	15.80	38.59	46.44	59.89	59.82	55.11
Lane Group LOS	E	D	C	B	B	D	D	E	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.96	9.46	1.93	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: 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

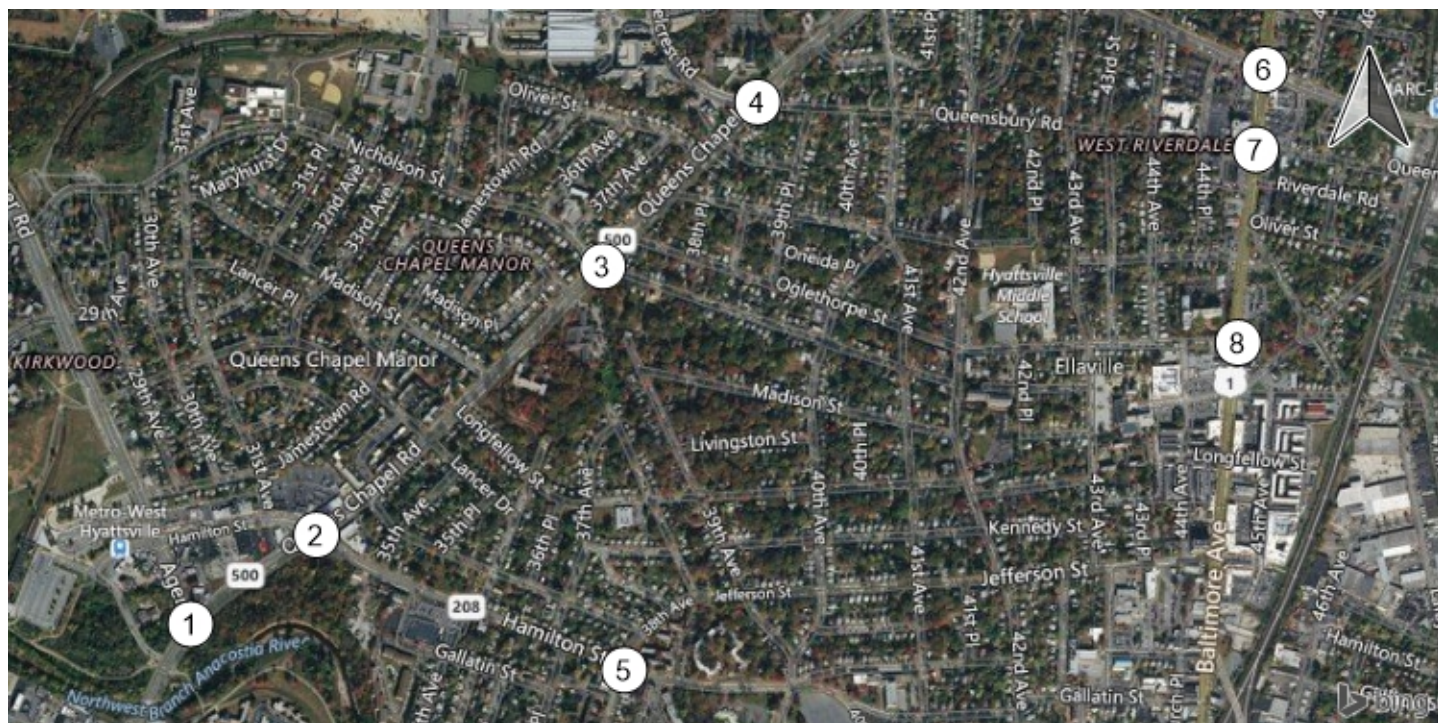
Lanes

Capacity per Entry Lane [veh/h]	600	702
Degree of Utilization, x	0.23	0.62

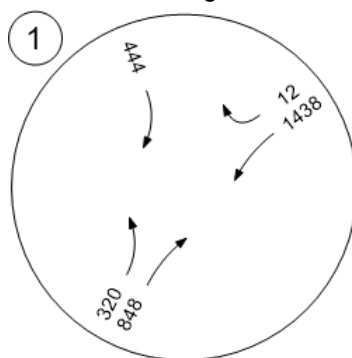
Movement, Approach, & Intersection Results

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	

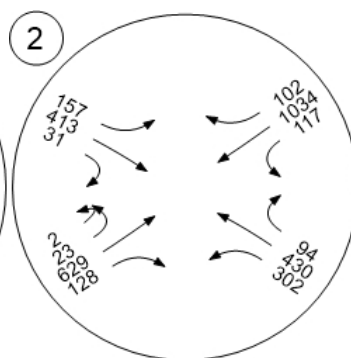
Traffic Volume - Future Total Volume



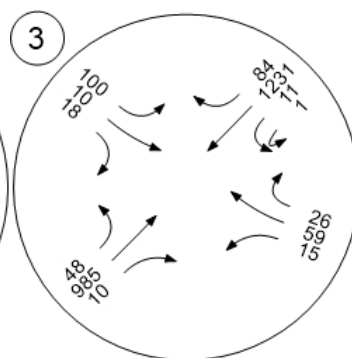
MD 500/Ager Rd



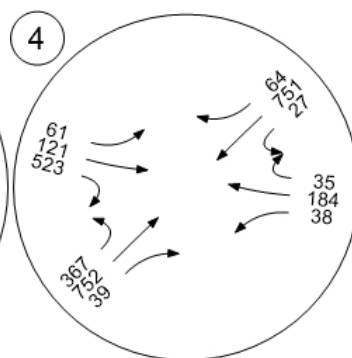
MD 500/Hamilton St



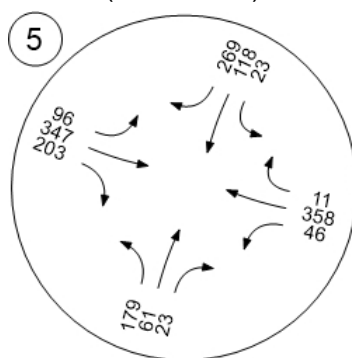
MD 500/Nicholson St



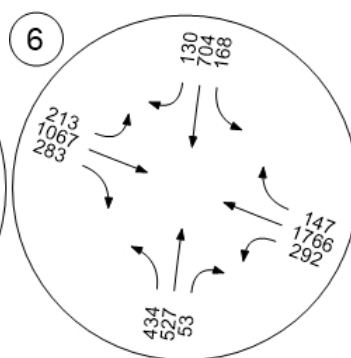
MD 500/Belcrest Rd/Queens



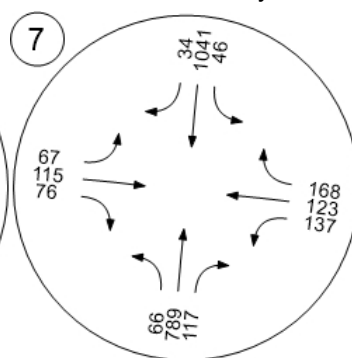
MD 208(Hamilton St)/38th Av



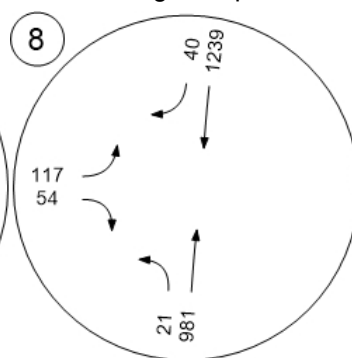
US 1/MD 410



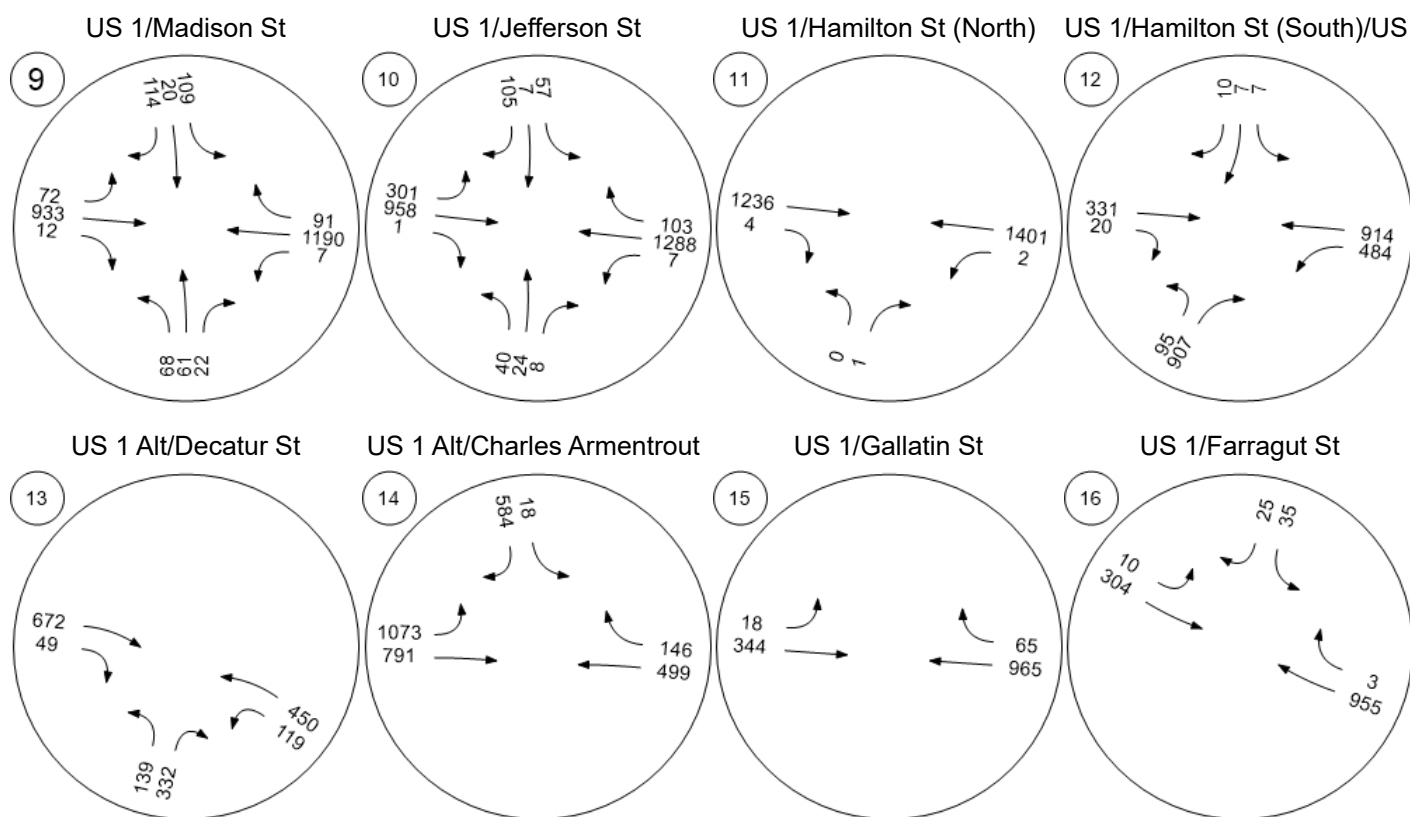
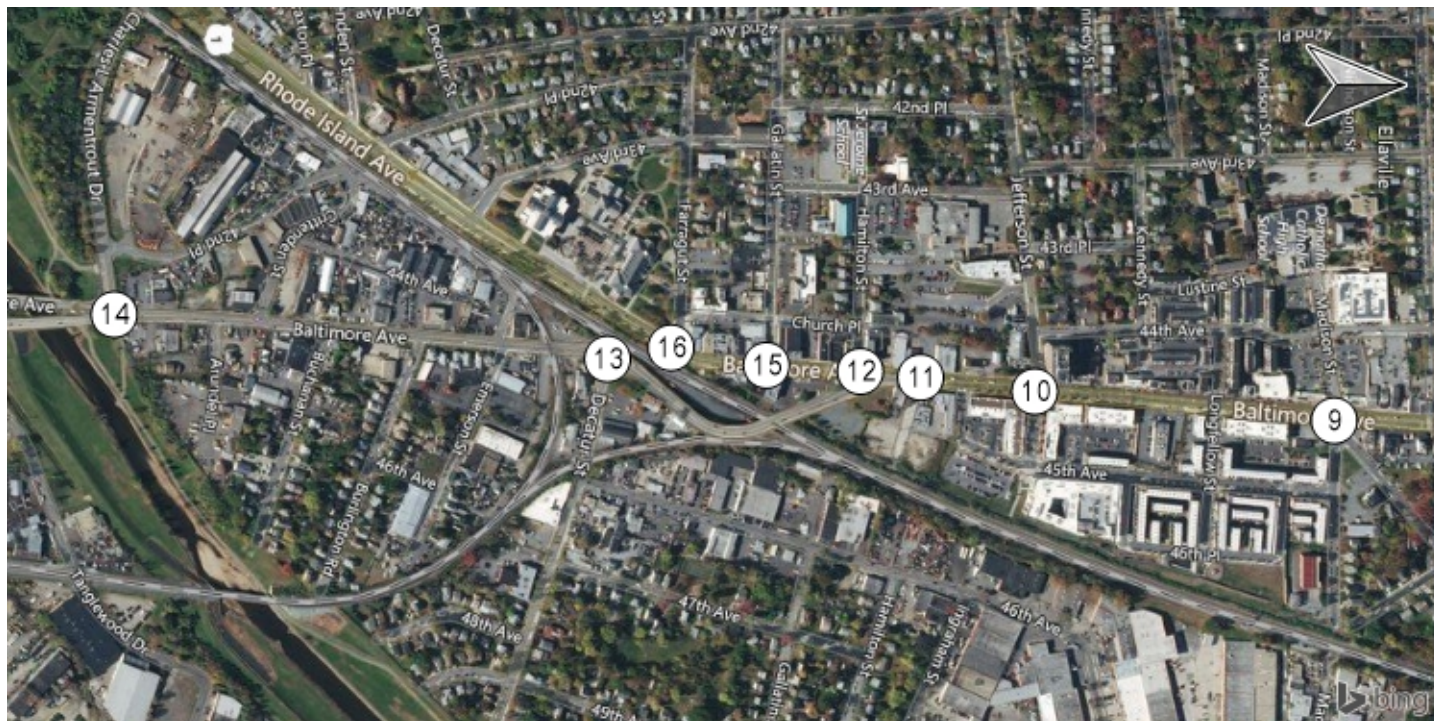
US 1/Queensbury Rd



US 1/Oglethorpe Rd

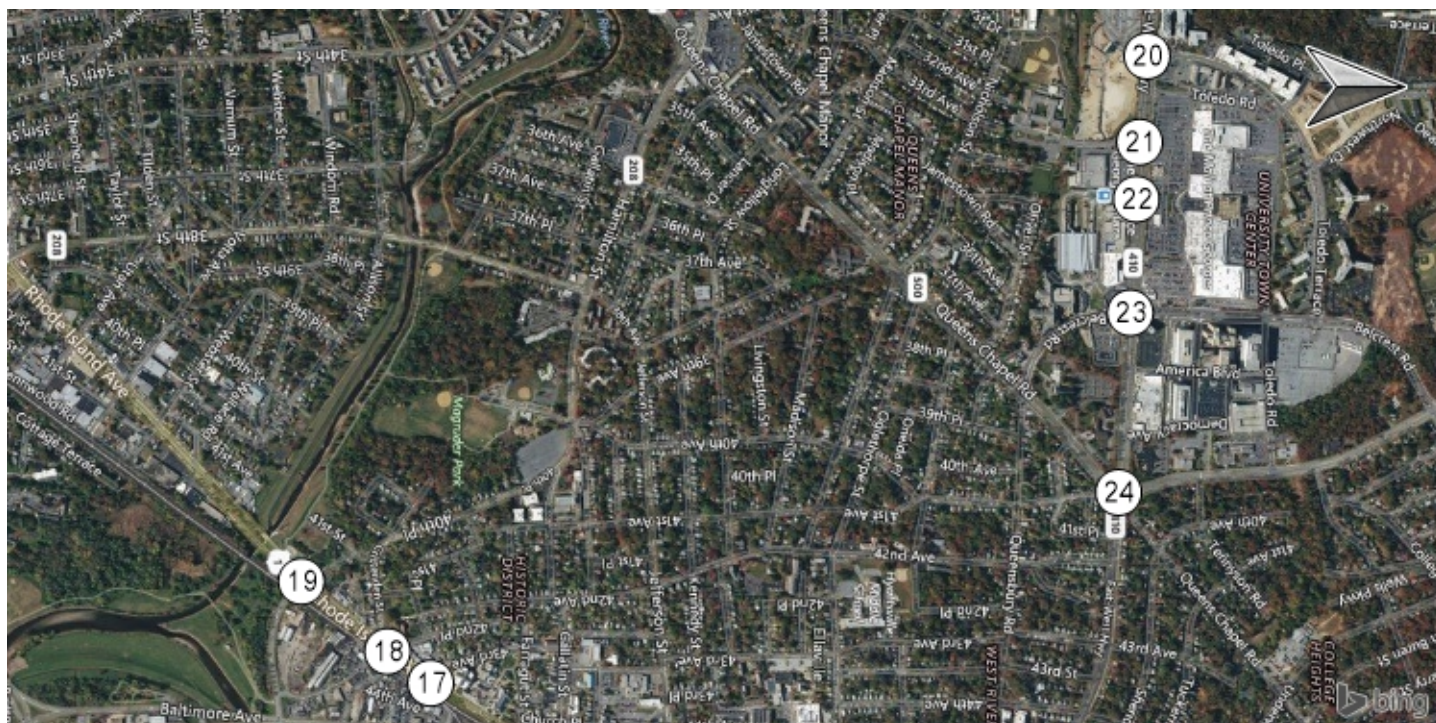


Traffic Volume - Future Total Volume

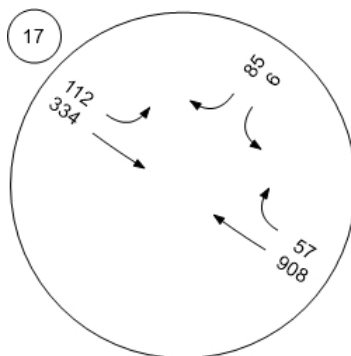


Version 6.00-00

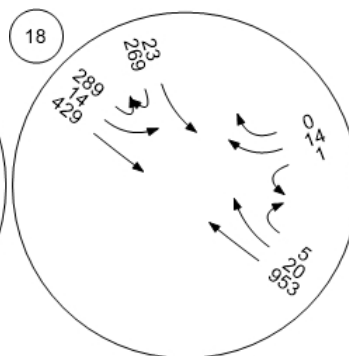
Traffic Volume - Future Total Volume



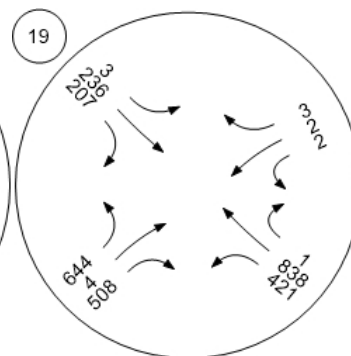
US 1/43rd Avenue



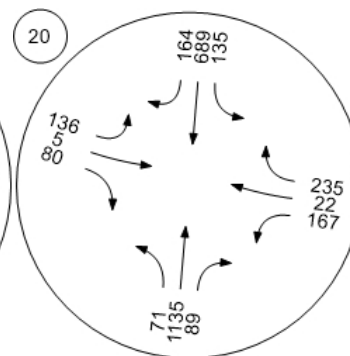
US 1/42nd Place/Crittendon



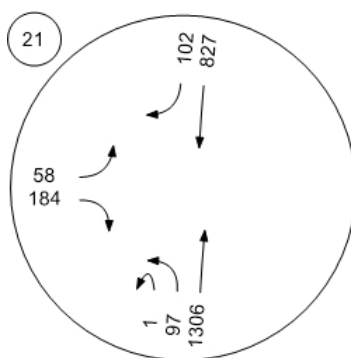
US 1/41st Place/Charles Arm



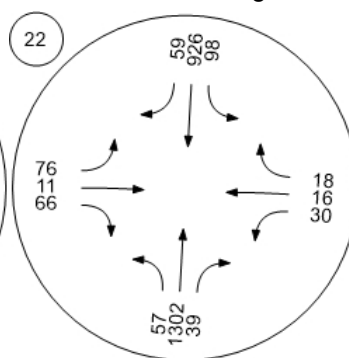
MD 410/Toledo Terrace



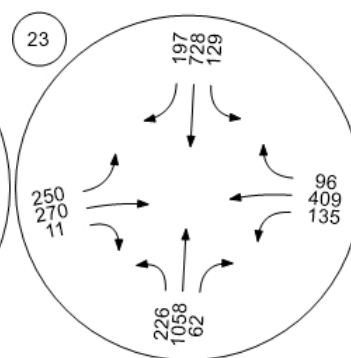
MD 410/Editors Park Dr



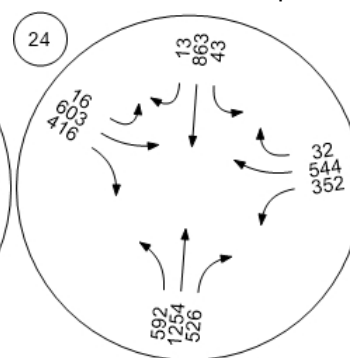
MD 410/Prince George's Plaz



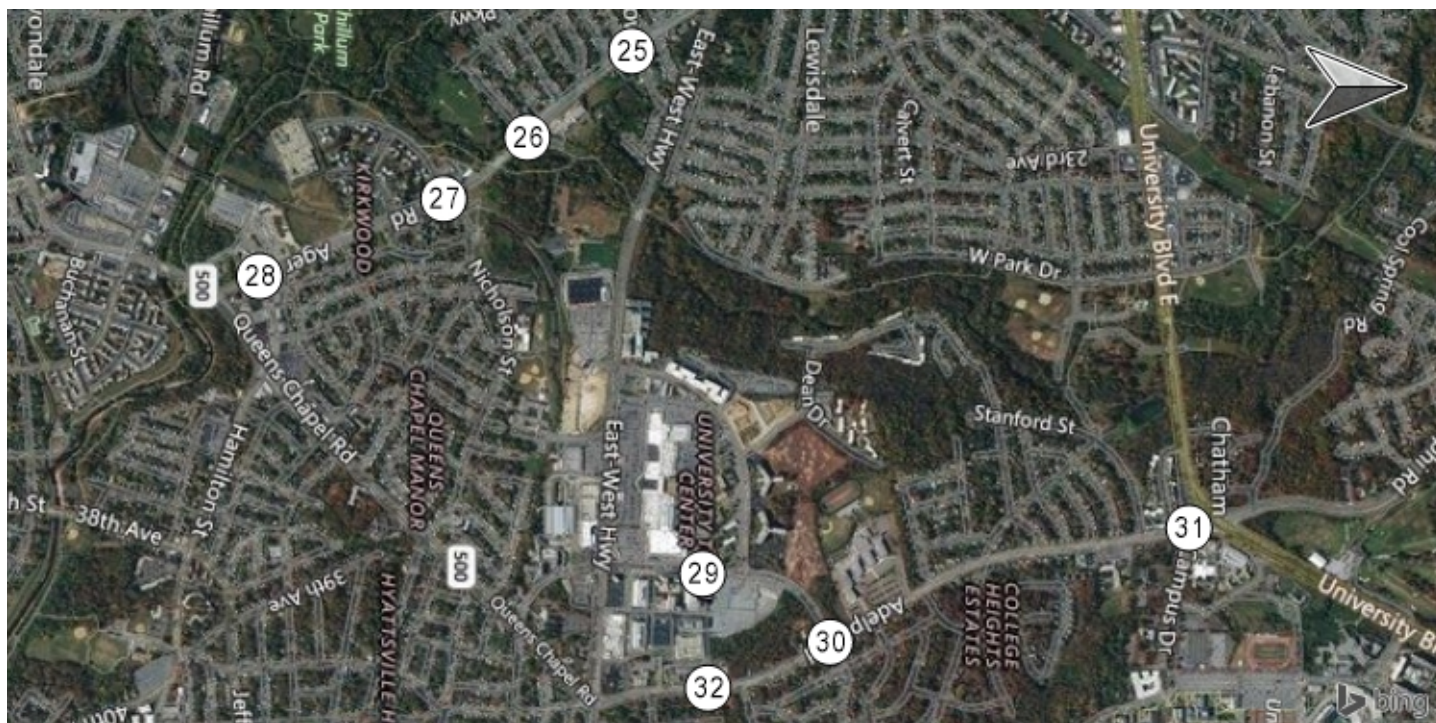
MD 410/Belcrest Rd



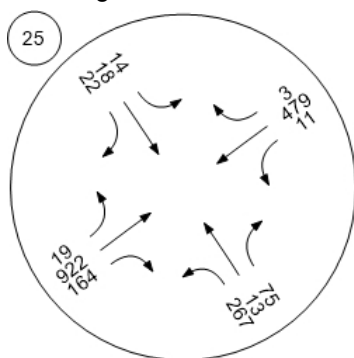
MD 410/MD 500/Adelphi Rd



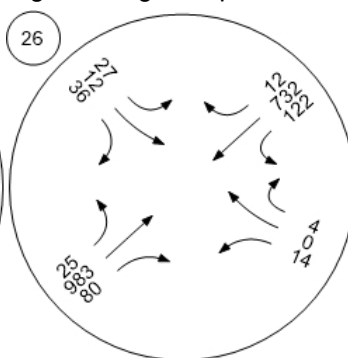
Traffic Volume - Future Total Volume



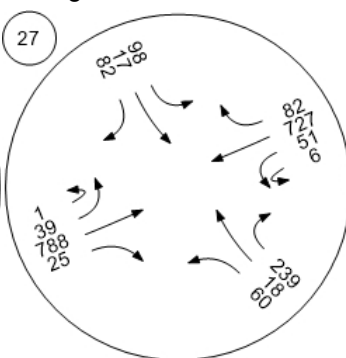
Ager Rd/23rd Ave



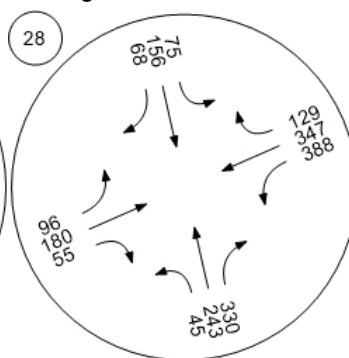
Ager Rd/Oglethorpe St/Scho



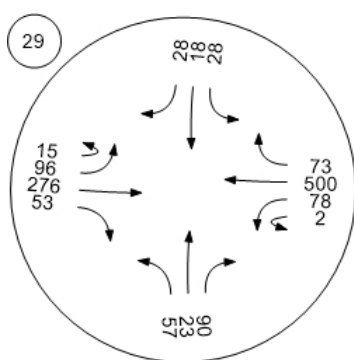
Ager Rd/Nicholson St



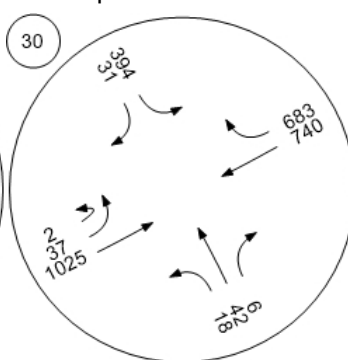
Ager Rd/Hamilton St



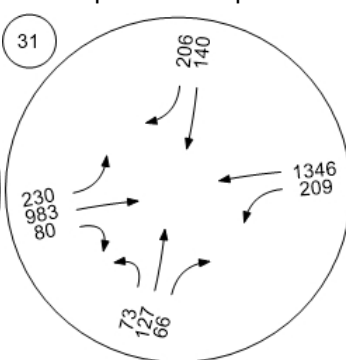
Toledo Rd/Belcrest Rd



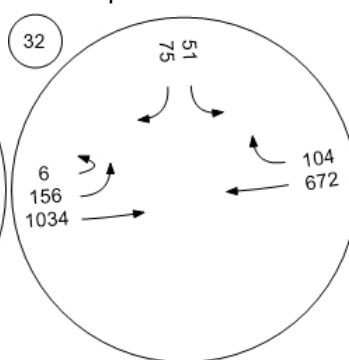
Adelphi Rd/Belcrest Rd



Adelphi Rd/Campus Dr



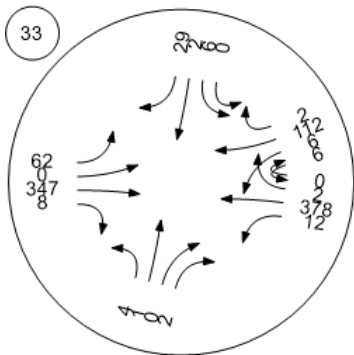
Adelphi Rd/Toledo Rd



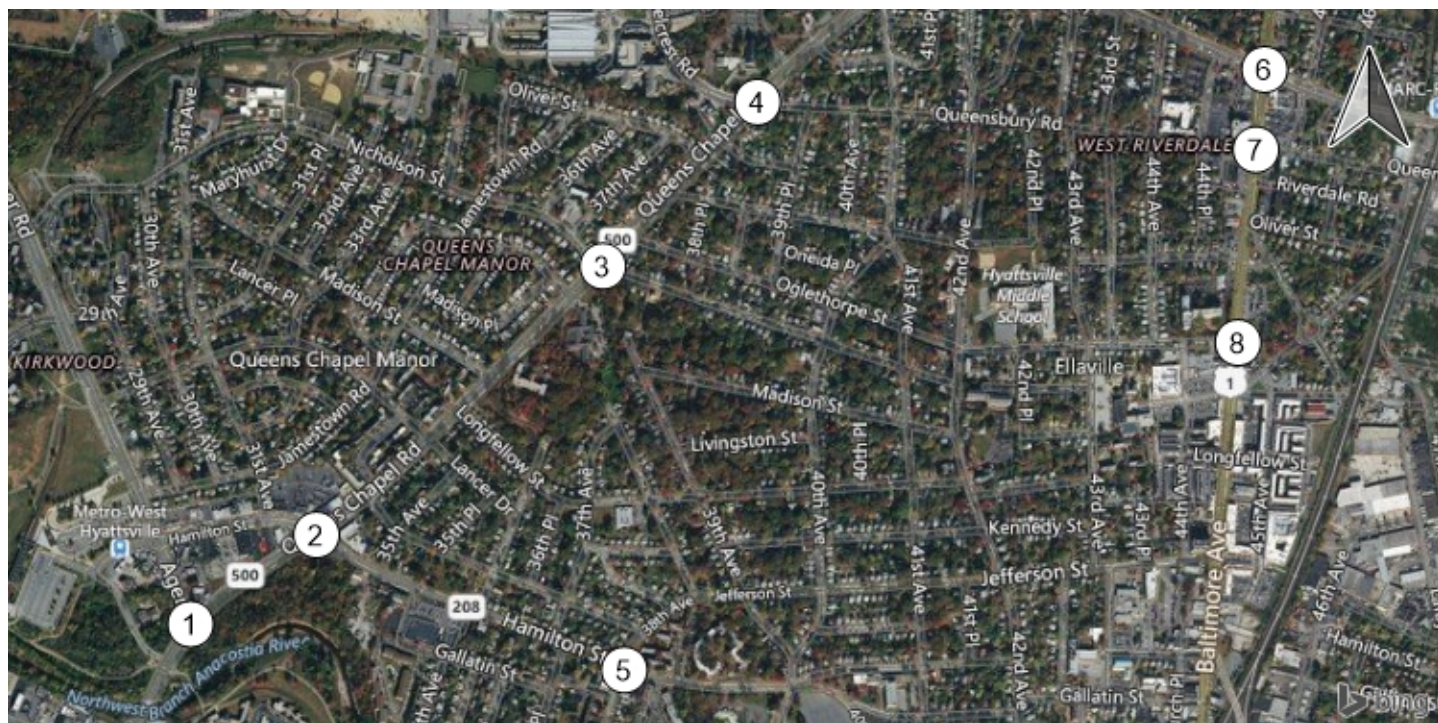
Traffic Volume - Future Total Volume



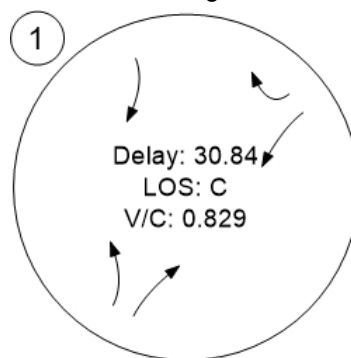
Hamilton St/40th Pl/39th Ave



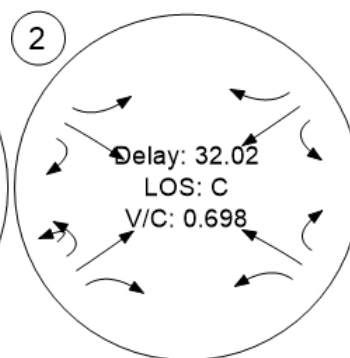
Traffic Conditions



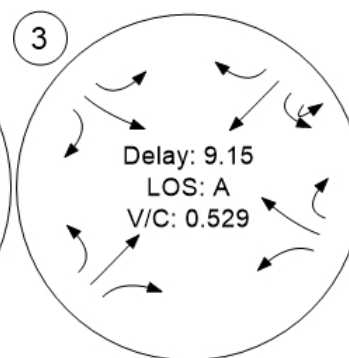
MD 500/Ager Rd



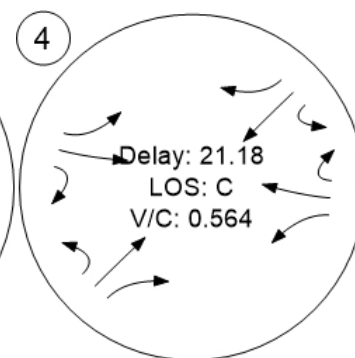
MD 500/Hamilton St



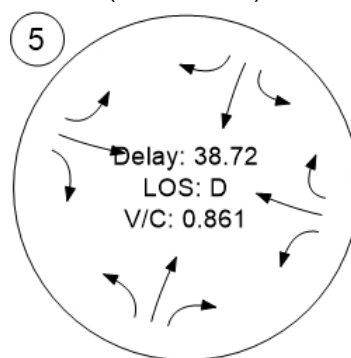
MD 500/Nicholson St



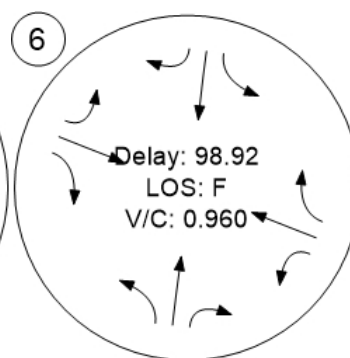
MD 500/Belcrest Rd/Queens



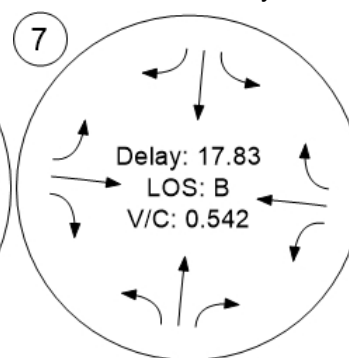
MD 208(Hamilton St)/38th Av



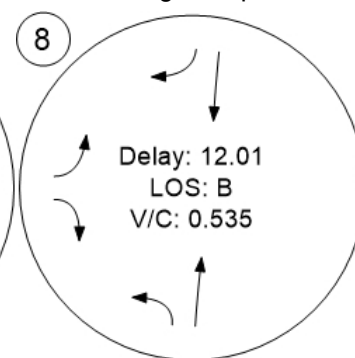
US 1/MD 410



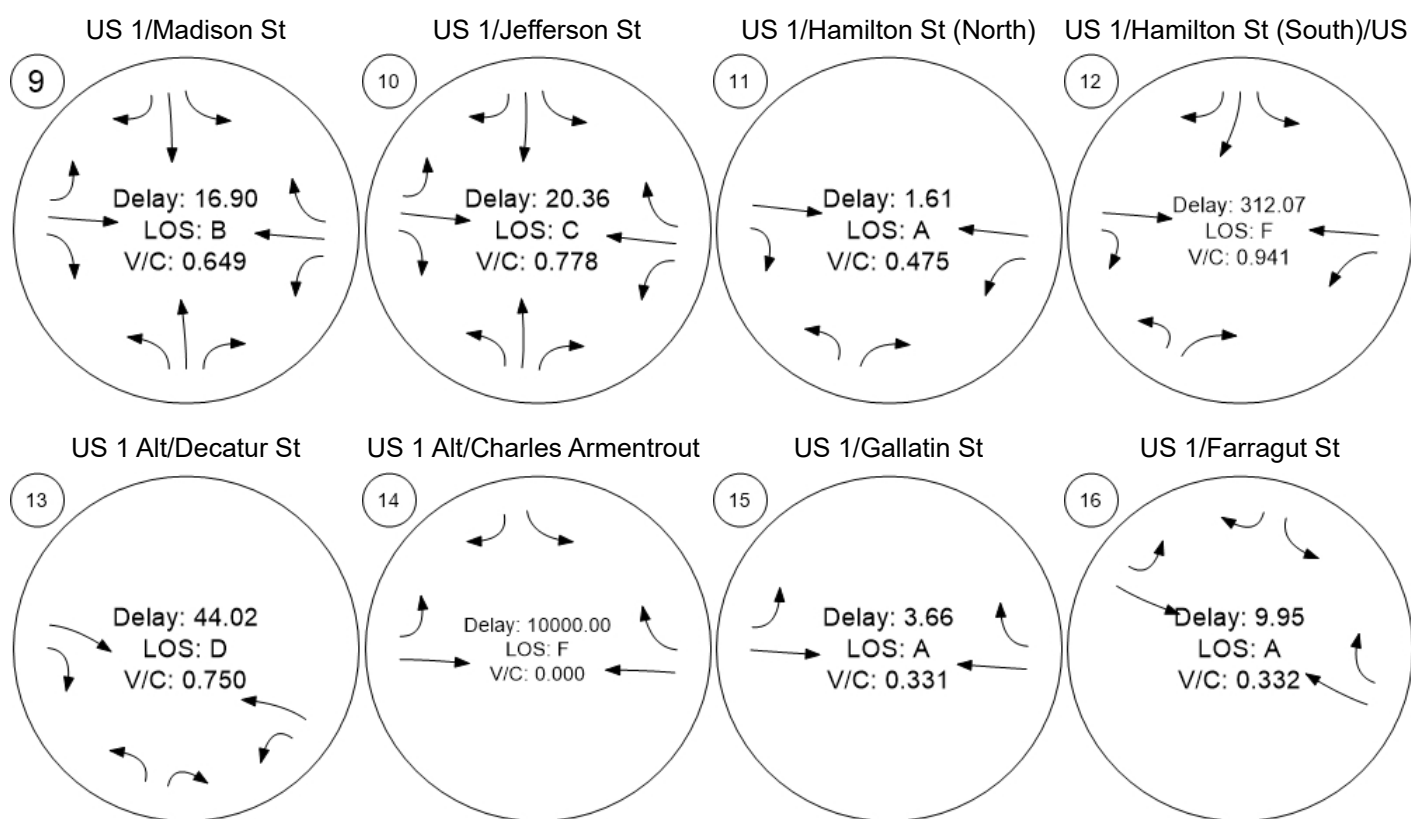
US 1/Queensbury Rd



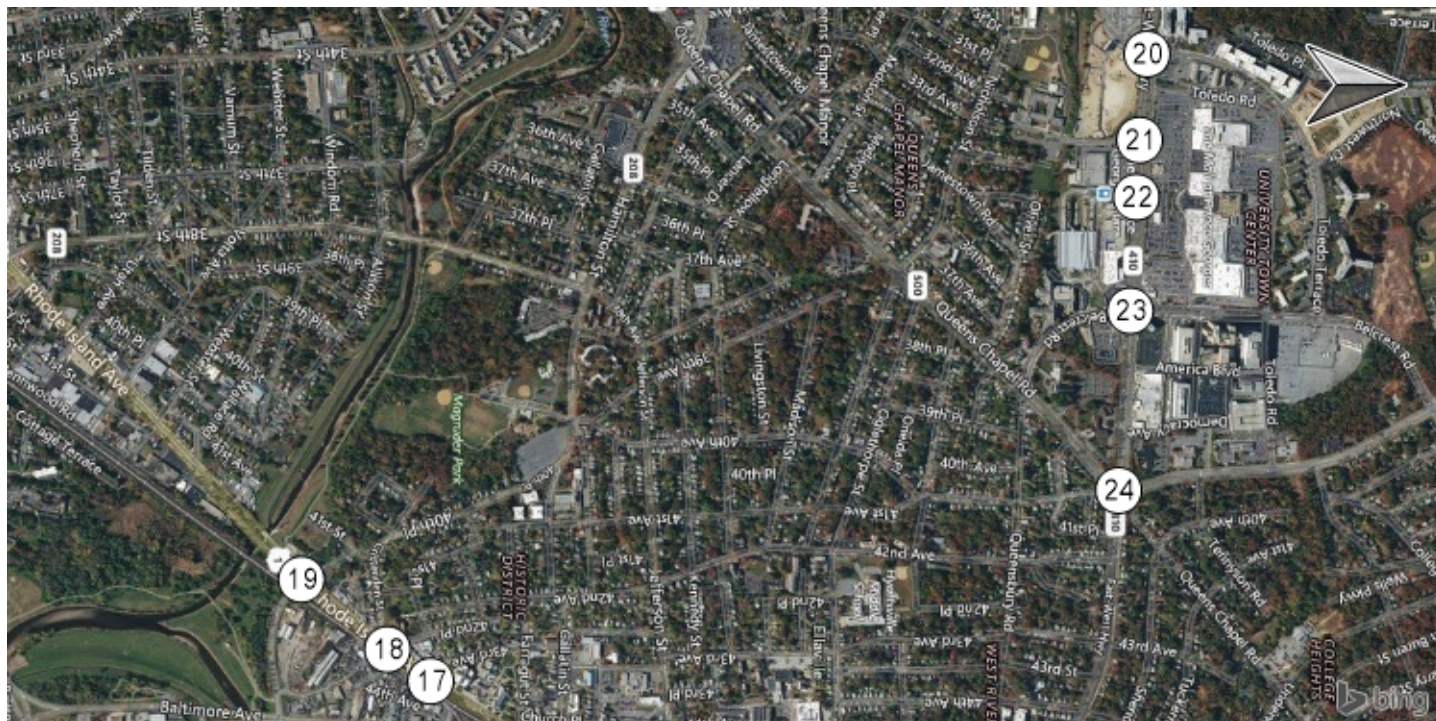
US 1/Oglethorpe Rd



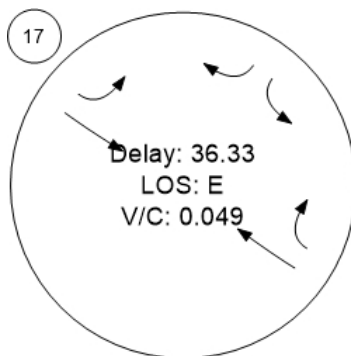
Traffic Conditions



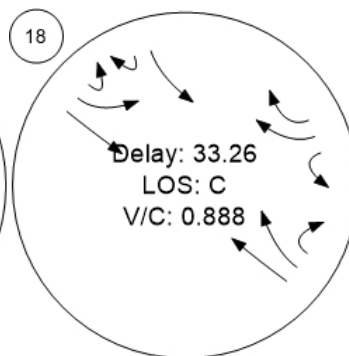
Traffic Conditions



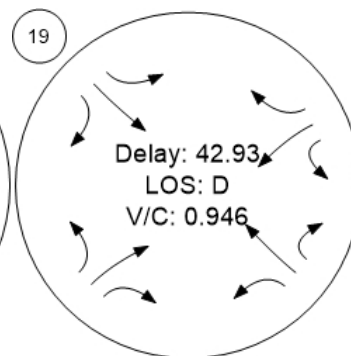
US 1/43rd Avenue



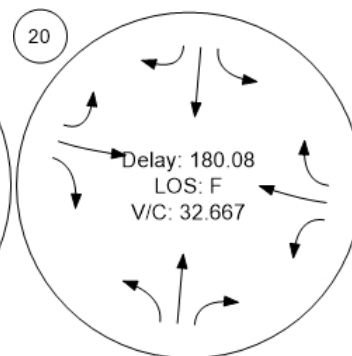
US 1/42nd Place/Crittendon



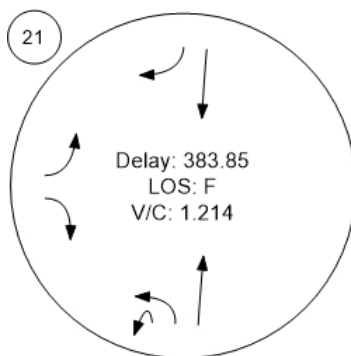
US 1/41st Place/Charles Arm



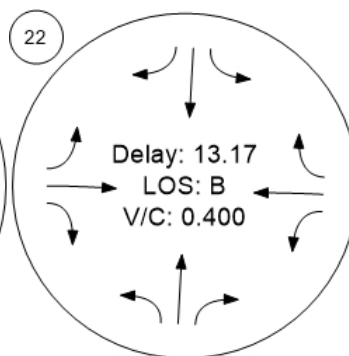
MD 410/Toledo Terrace



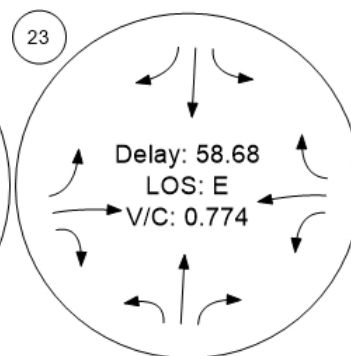
MD 410/Editors Park Dr



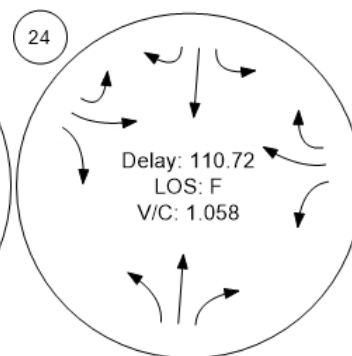
MD 410/Prince George's Plaz



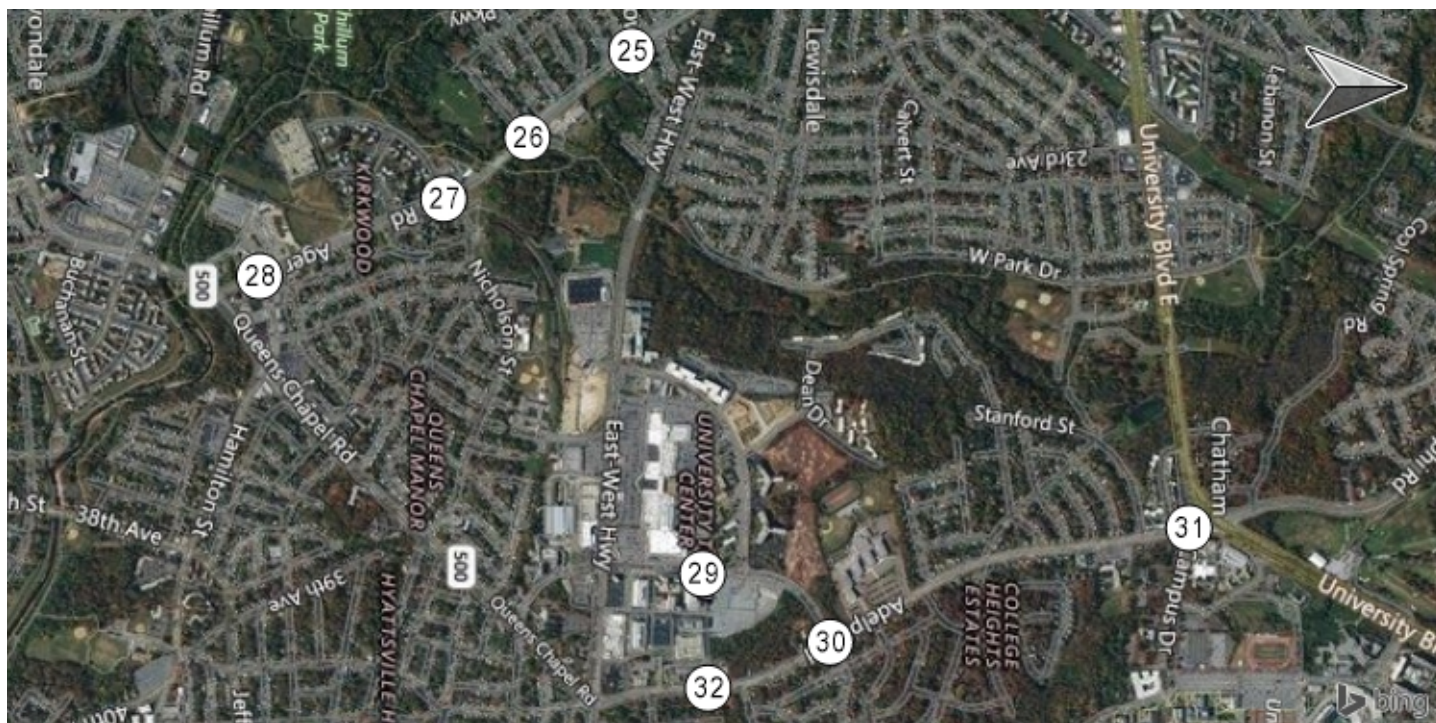
MD 410/Belcrest Rd



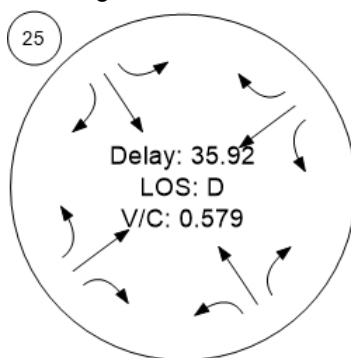
MD 410/MD 500/Adelphi Rd



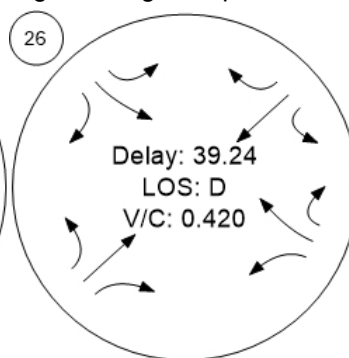
Traffic Conditions



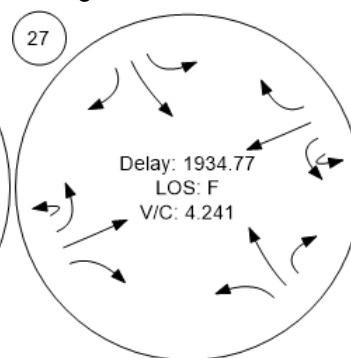
Ager Rd/23rd Ave



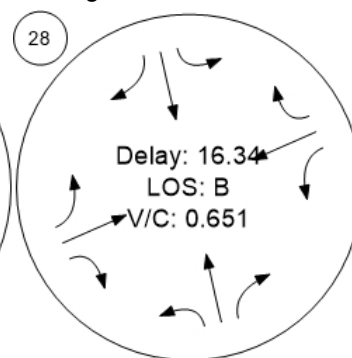
Ager Rd/Oglethorpe St/Scho



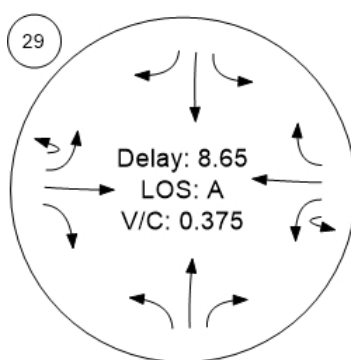
Ager Rd/Nicholson St



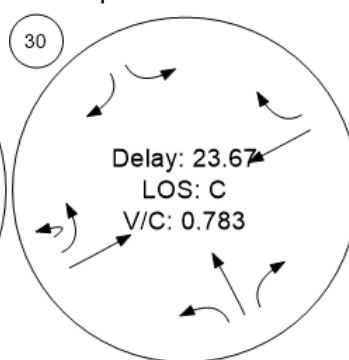
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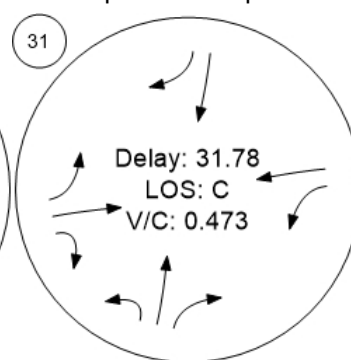
Toledo Rd/Belcrest Rd



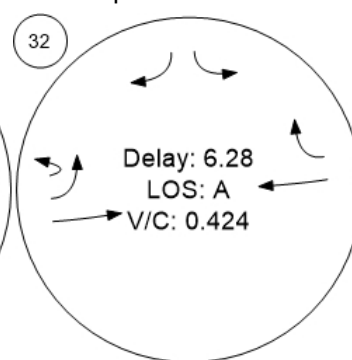
Adelphi Rd/Belcrest Rd



Adelphi Rd/Campus Dr



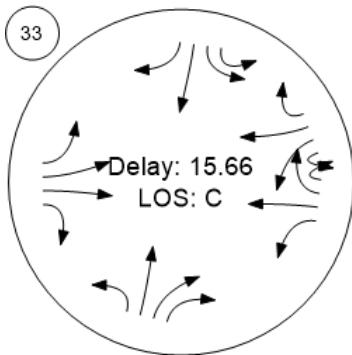
Adelphi Rd/Toledo Rd



Traffic Conditions



Hamilton St/40th Pl/39th Ave



Hyattsville Transportation Plan

Vistro File: K:\...\2037 PM Build.vistro

Scenario: Base Scenario

Report File: K:\...\2037 PM_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	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

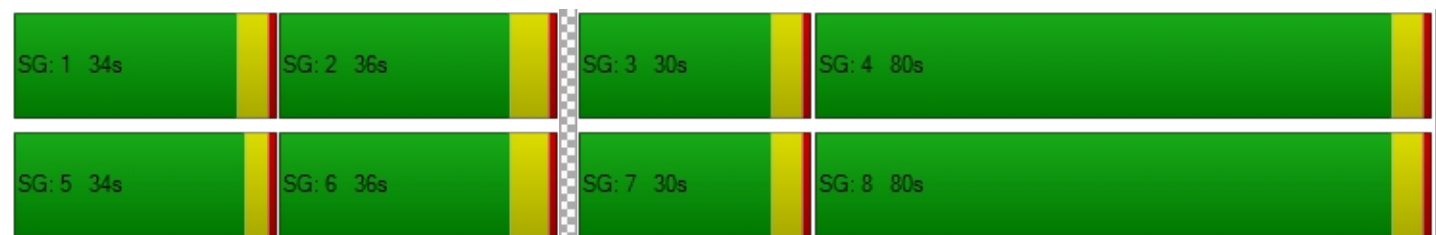
X, volume / capacity	0.55	1.34	0.67	0.77	0.74	0.38	0.64	0.96	0.77	0.80
d, Delay for Lane Group [s/veh]	44.11	220.84	59.32	74.44	55.90	46.68	43.97	73.76	51.48	53.01
Lane Group LOS	D	F	E	E	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	5.03	51.60	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												
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

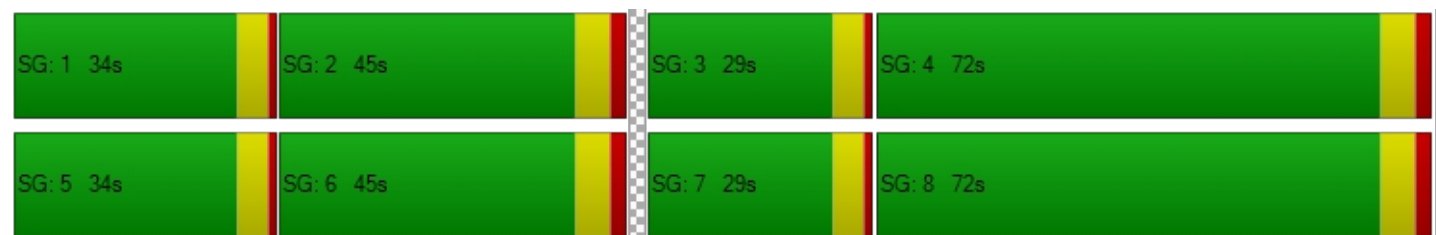
X, volume / capacity	0.86	0.73	0.73	0.70	1.09	1.10	1.65	1.26	0.68	0.86	0.92	0.92
d, Delay for Lane Group [s/veh]	61.69	70.46	70.98	52.04	138.32	142.81	388.15	178.07	49.88	87.30	66.14	75.65
Lane Group LOS	E	E	E	D	F	F	F	F	D	F	E	E
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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

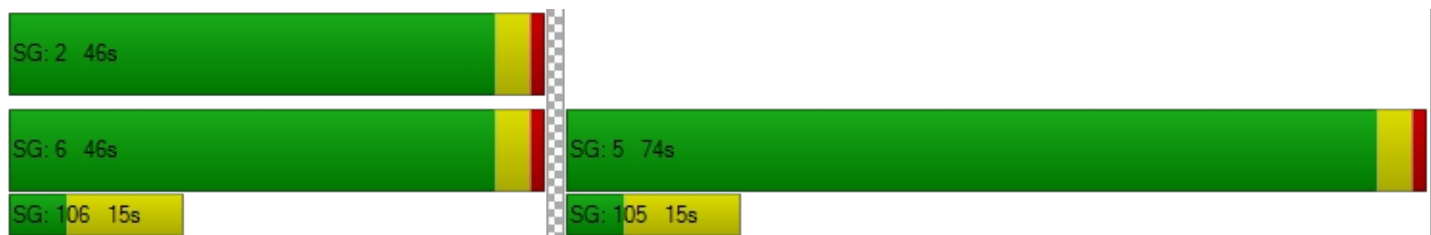
X, volume / capacity	0.76	0.72	0.74	0.76	0.43
d, Delay for Lane Group [s/veh]	22.37	7.08	7.53	38.74	3.88
Lane Group LOS	C	A	A	D	A
Critical Lane Group	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.25	2.00	2.12	2.77	0.56
50th-Percentile Queue Length [ft/ln]	56.20	49.89	53.00	69.17	14.09
95th-Percentile 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

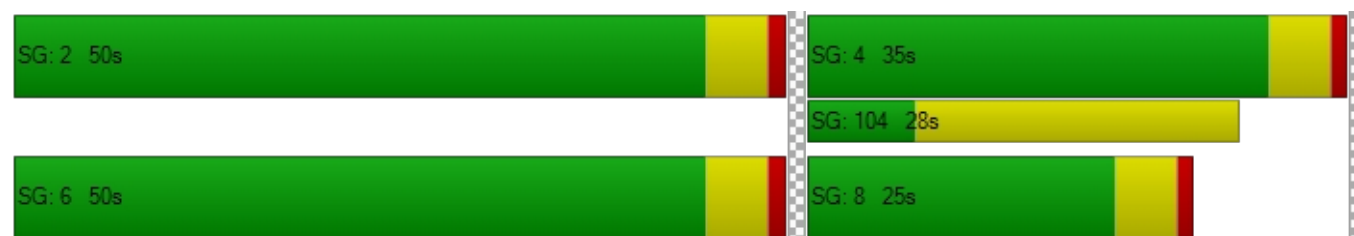
d_M, Delay for Movement [s/veh]	28.79	28.79	28.79	28.13	28.13	28.13	23.43	15.44	15.44	19.95	17.52	17.52
Movement LOS	C	C	C	C	C	C	C	B	B	B	B	B
d_A, Approach Delay [s/veh]	28.79			28.13			15.69			17.59		
Approach LOS	C			C			B			B		
d_I, Intersection Delay [s/veh]	18.68											
Intersection LOS	B											
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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

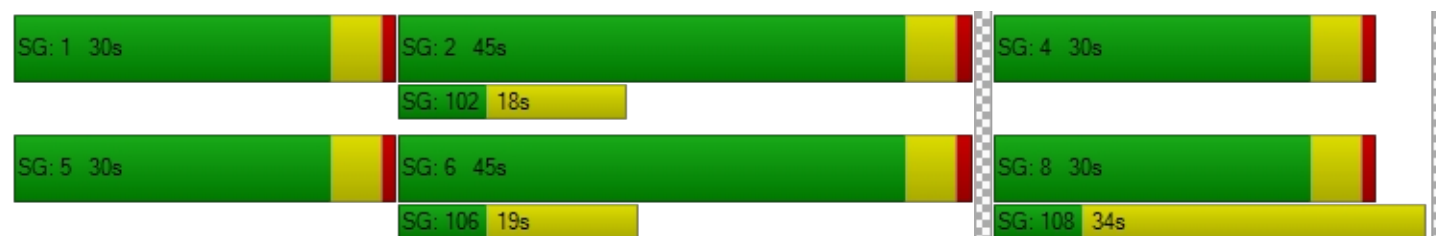
d_M, Delay for Movement [s/veh]	34.38	34.38	34.38	32.45	32.45	32.45	13.85	42.89	42.89	11.08	53.40	53.51
Movement LOS	C	C	C	C	C	C	B	D	D	B	D	D
d_A, Approach Delay [s/veh]	34.38			32.45			41.49			53.29		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	47.24											
Intersection LOS	D											
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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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		

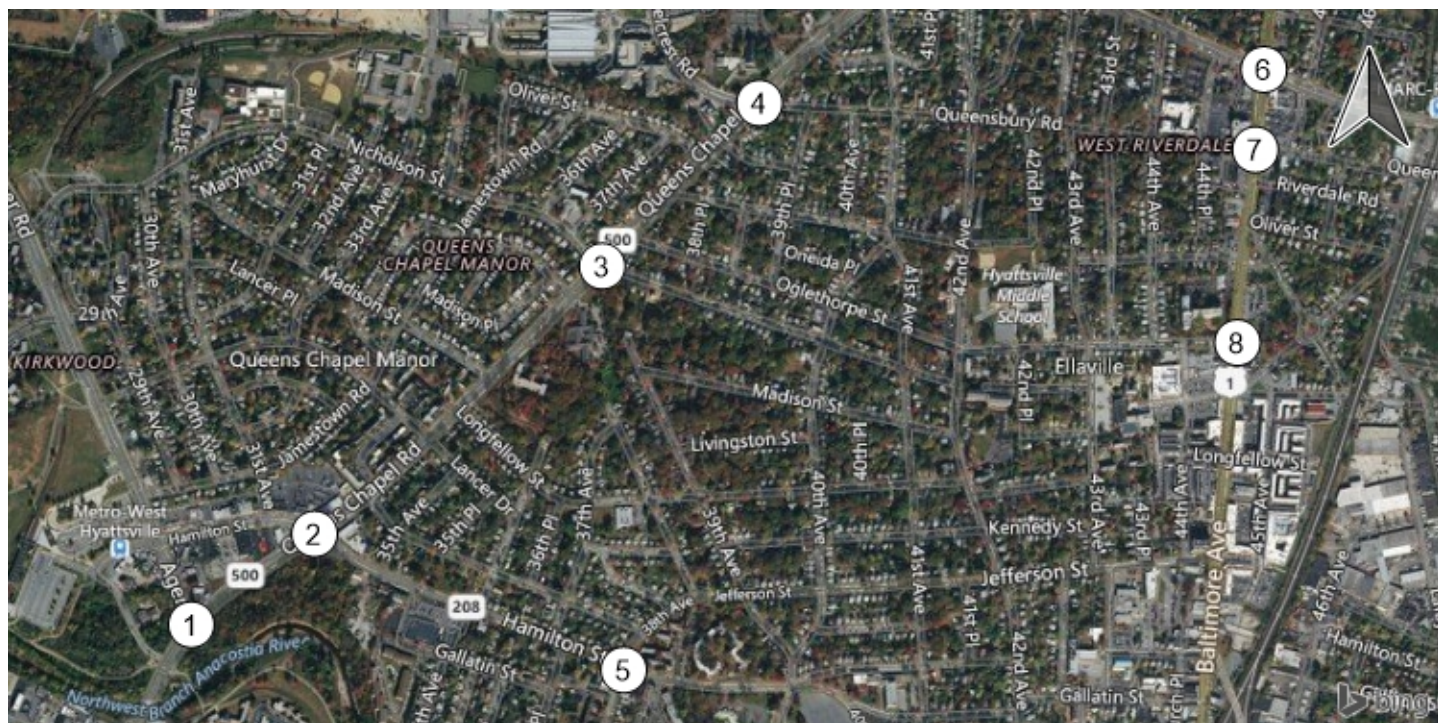
Intersection Settings

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

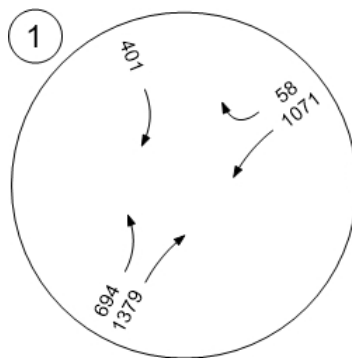
Movement, Approach, & Intersection Results

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											

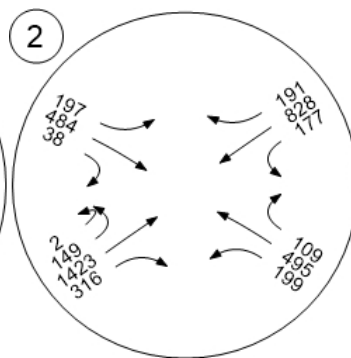
Traffic Volume - Future Total Volume



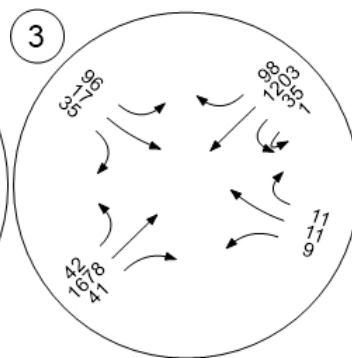
MD 500/Ager Rd



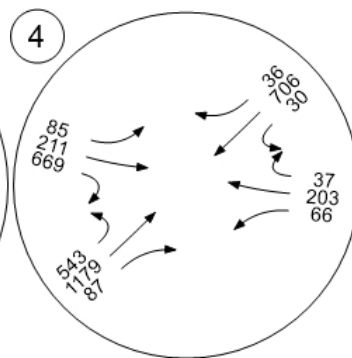
MD 500/Hamilton St



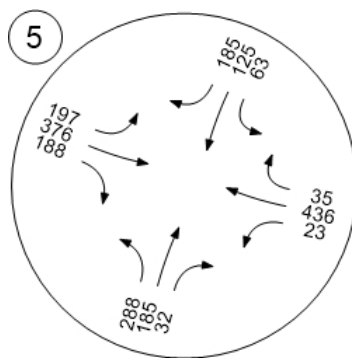
MD 500/Nicholson St



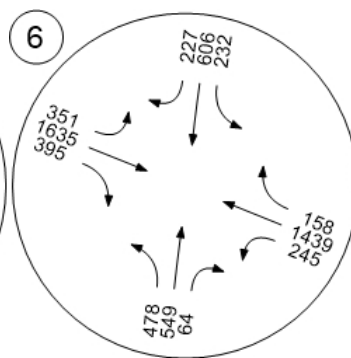
MD 500/Belcrest Rd/Queens



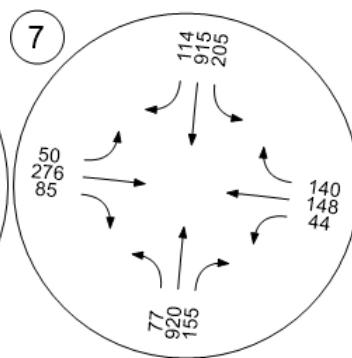
MD 208(Hamilton St)/38th Av



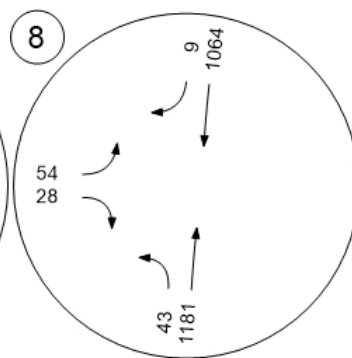
US 1/MD 410



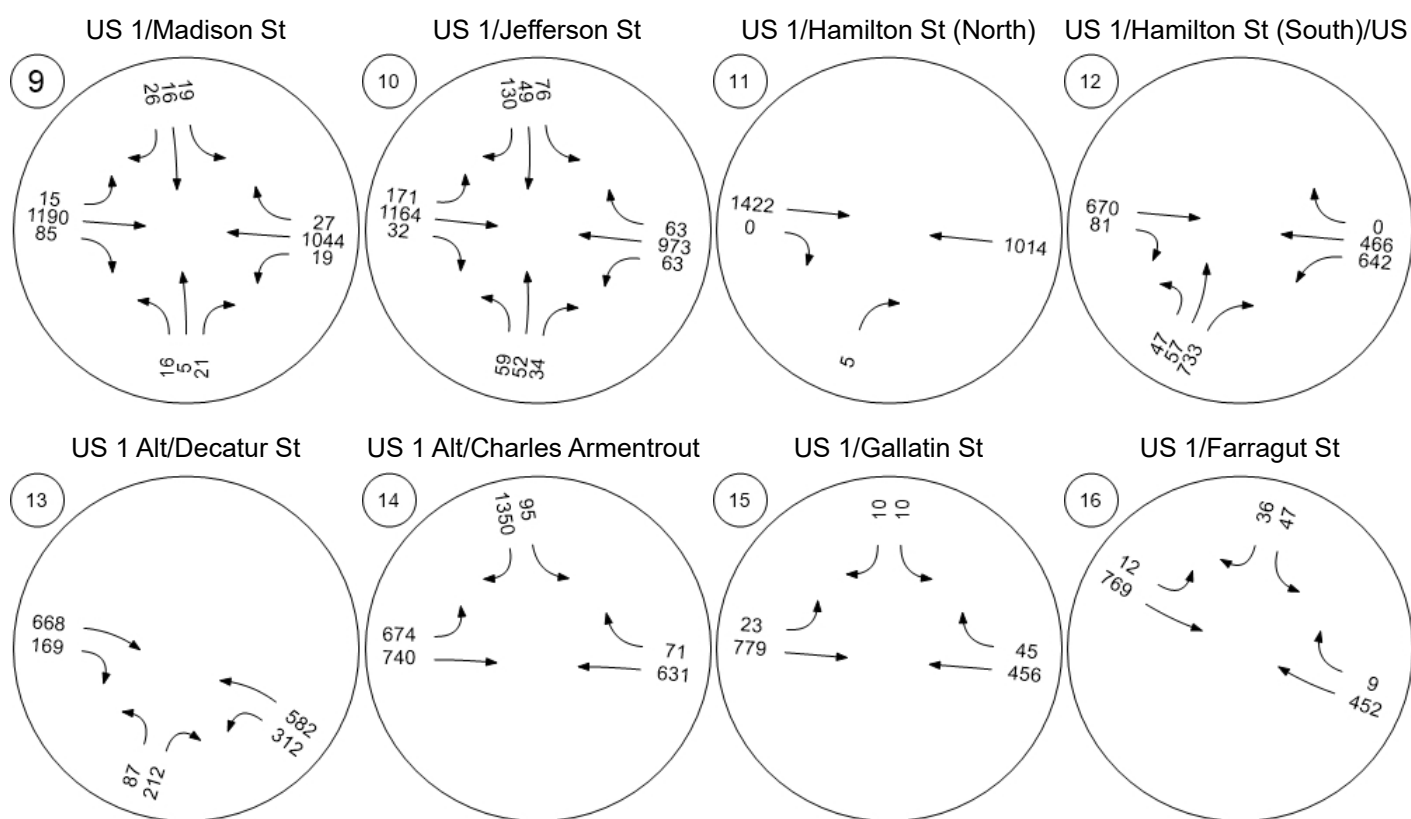
US 1/Queensbury Rd



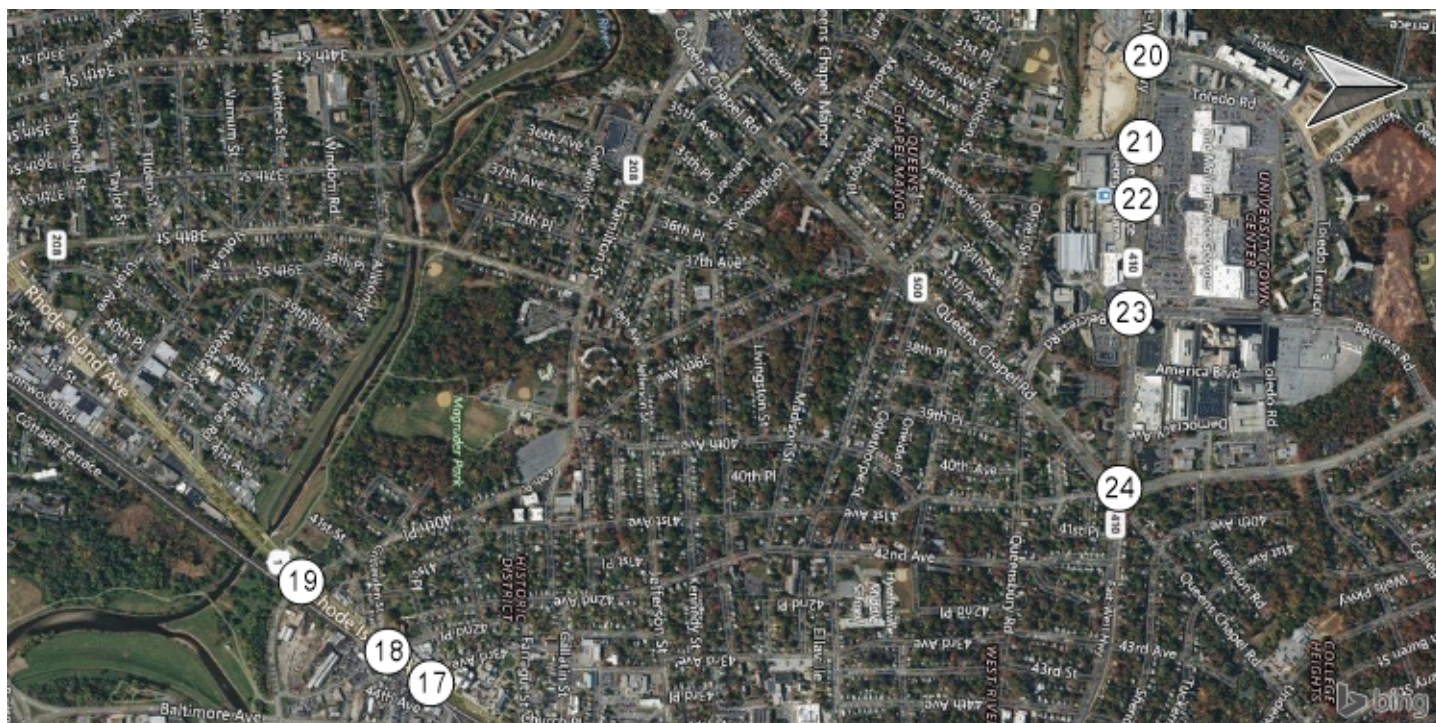
US 1/Oglethorpe Rd



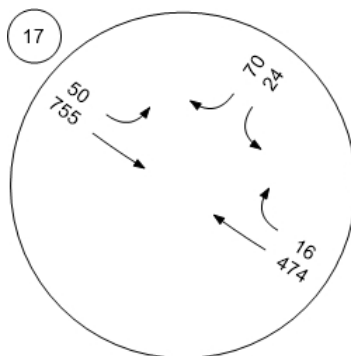
Traffic Volume - Future Total Volume



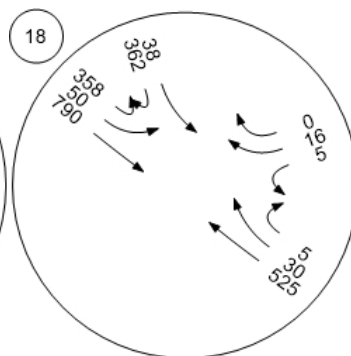
Traffic Volume - Future Total Volume



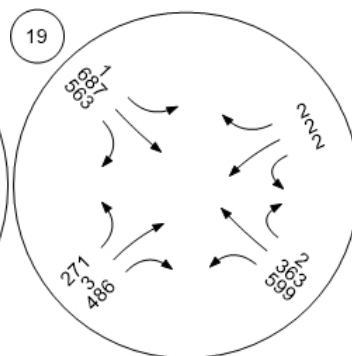
US 1/43rd Ave



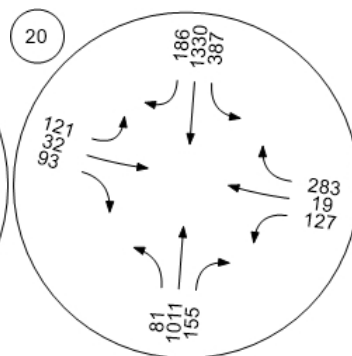
US 1/42nd Place/Crittendon



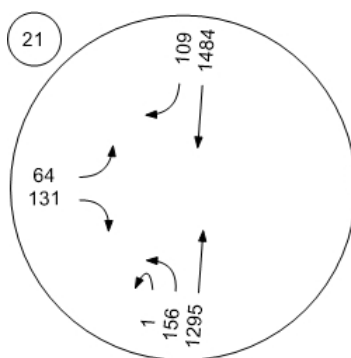
US 1/41st Place/Charles Arm



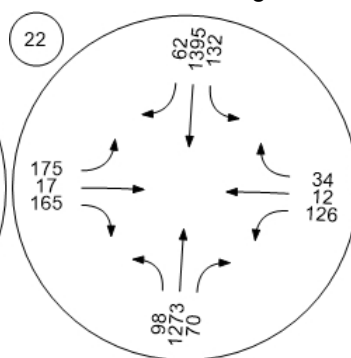
MD 410/Toledo Terrace



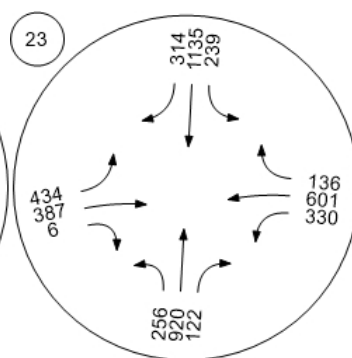
MD 410/Editors Park Dr



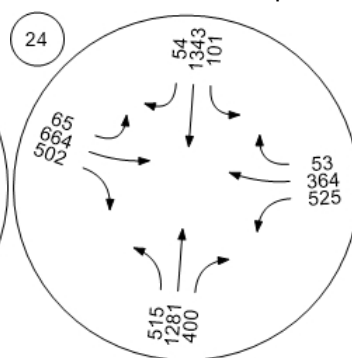
MD 410/Prince George's Plaza



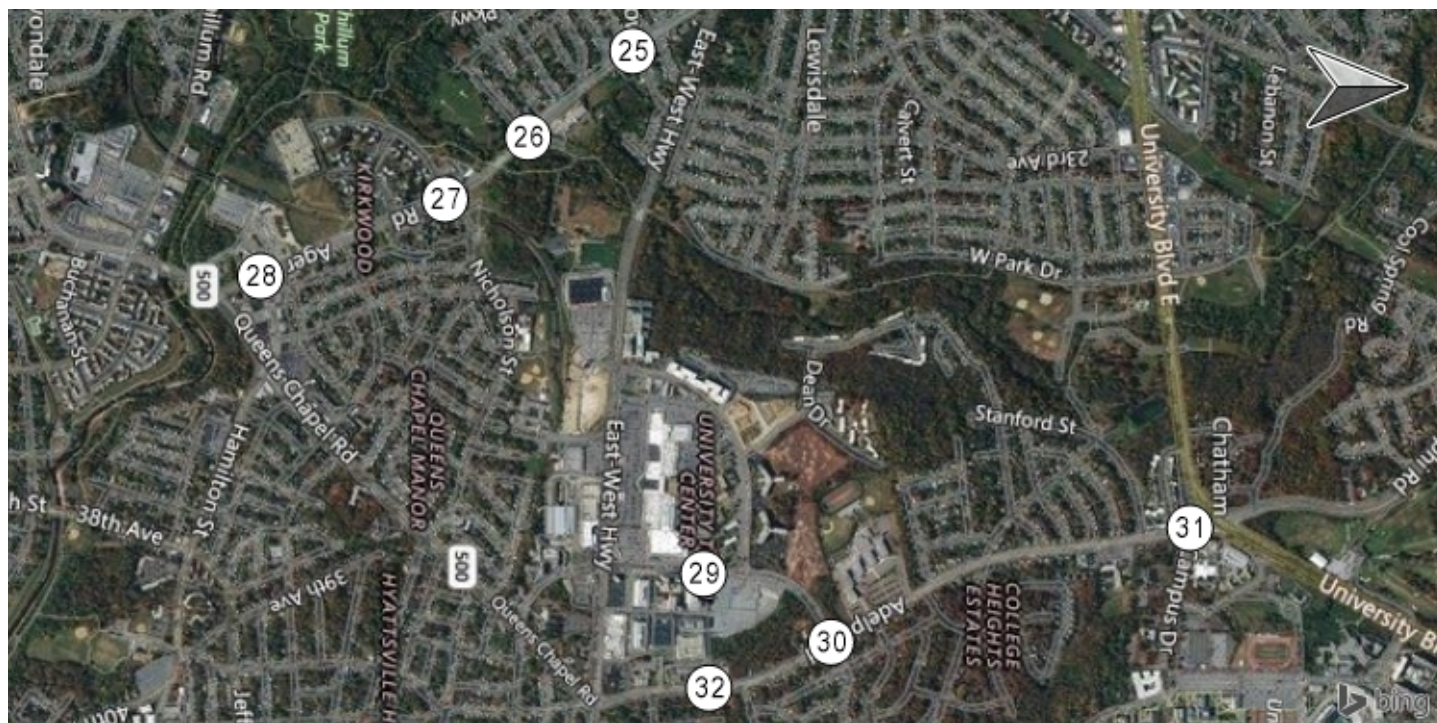
MD 410/Belcrest Rd



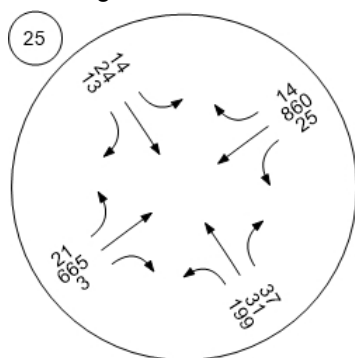
MD 410/MD 500/Adelphi Rd



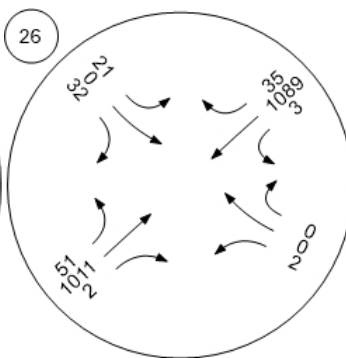
Traffic Volume - Future Total Volume



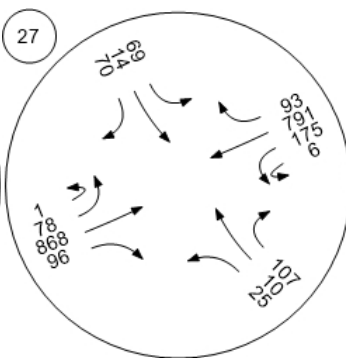
Ager Rd/23rd Ave



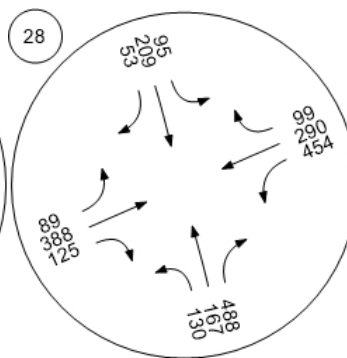
Ager Rd/Oglethorpe St/Scho



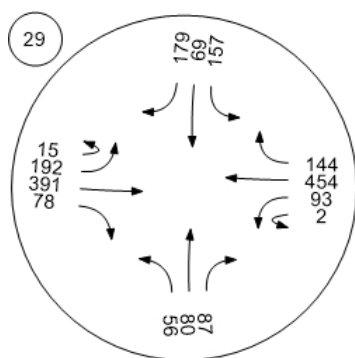
Ager Rd/Nicholson St



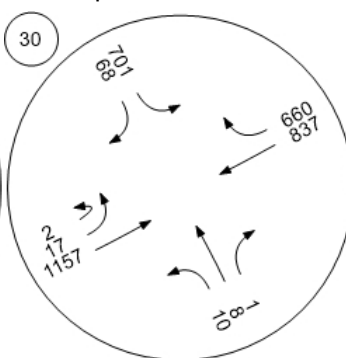
Ager Rd/Hamilton St



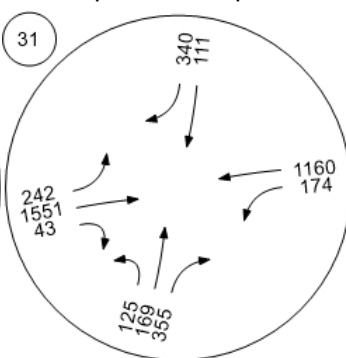
Toledo Rd/Belcrest Rd



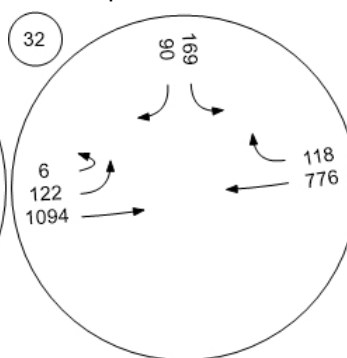
Adelphi Rd/Belcrest Rd



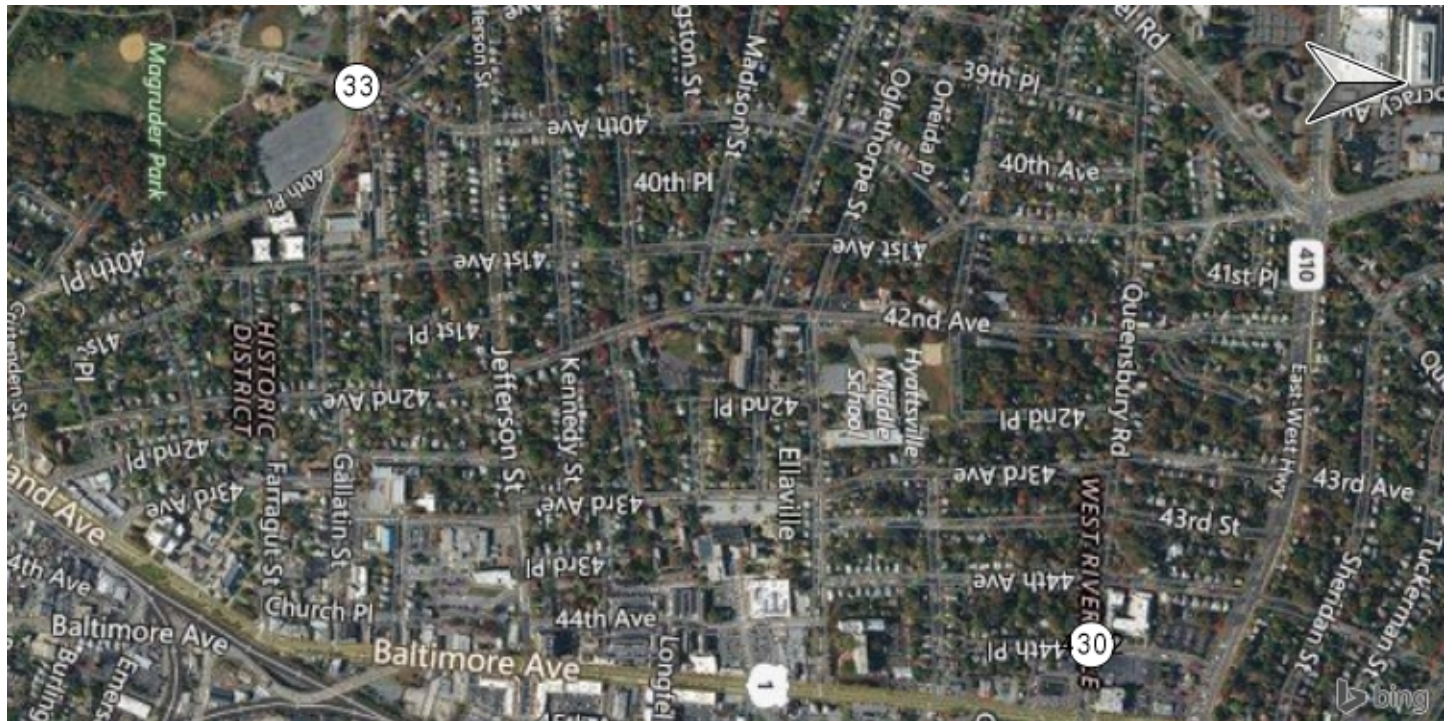
Adelphi Rd/Campus Dr



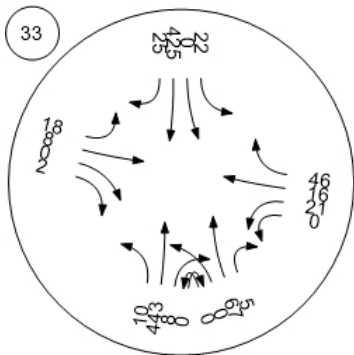
Adelphi Rd/Toledo Rd



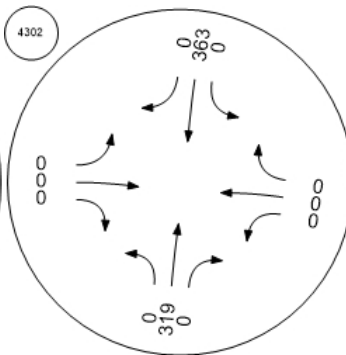
Traffic Volume - Future Total Volume



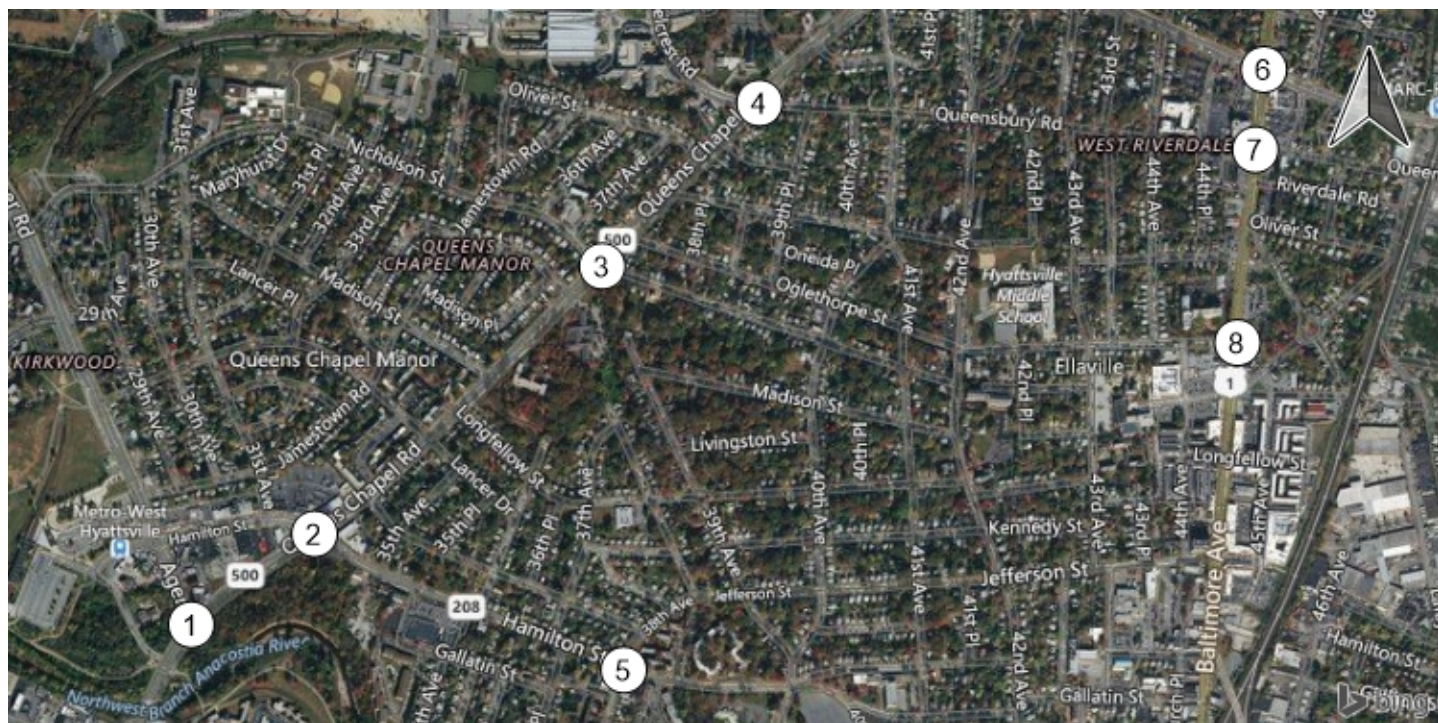
Hamilton St/40th Pl/39th Ave



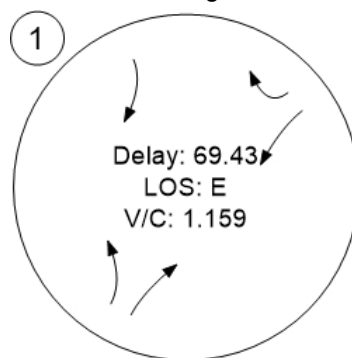
New Intersection



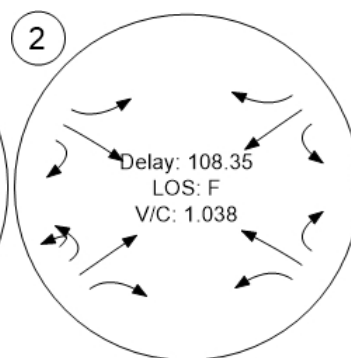
Traffic Conditions



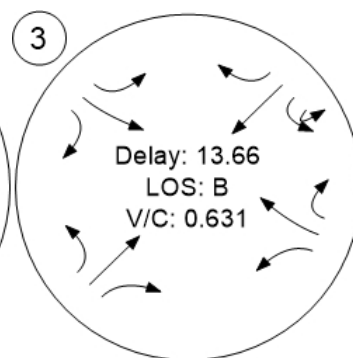
MD 500/Ager Rd



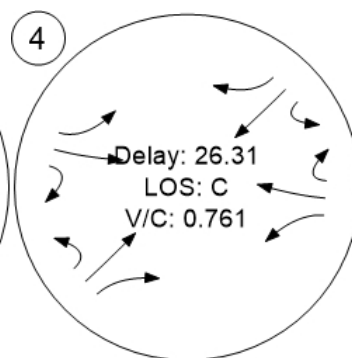
MD 500/Hamilton St



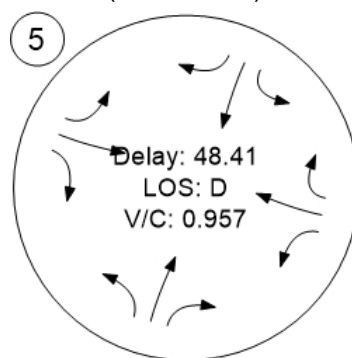
MD 500/Nicholson St



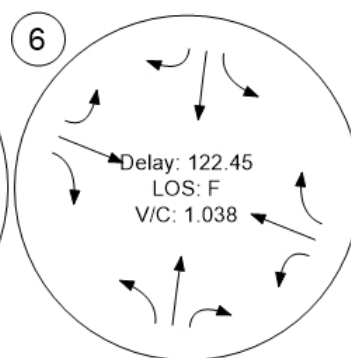
MD 500/Belcrest Rd/Queens



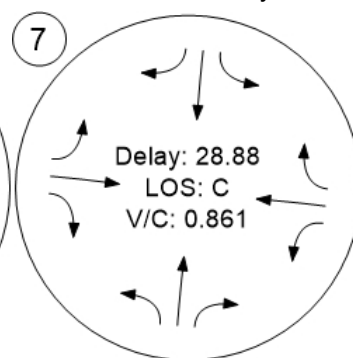
MD 208(Hamilton St)/38th Av



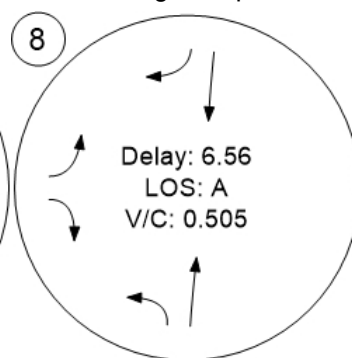
US 1/MD 410



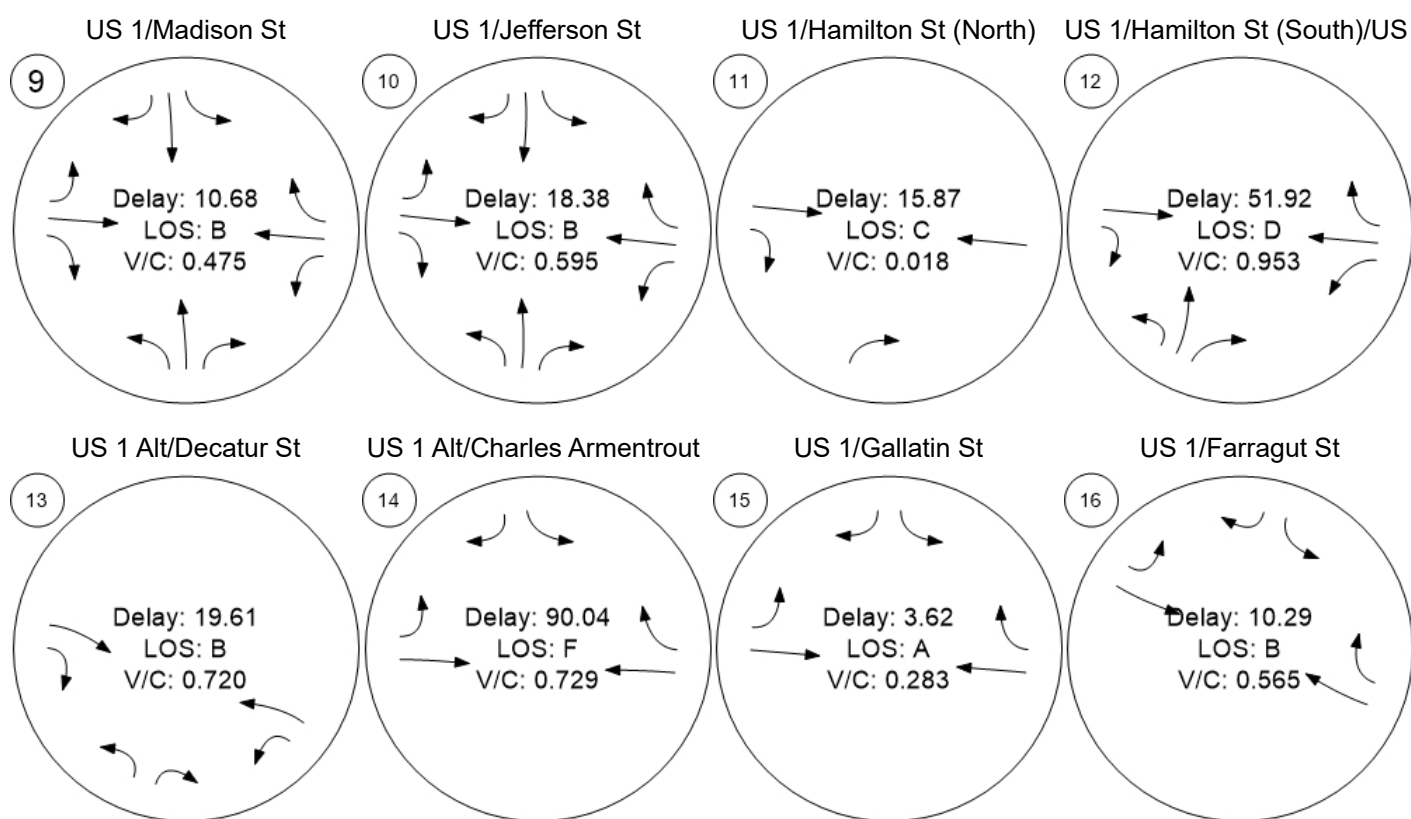
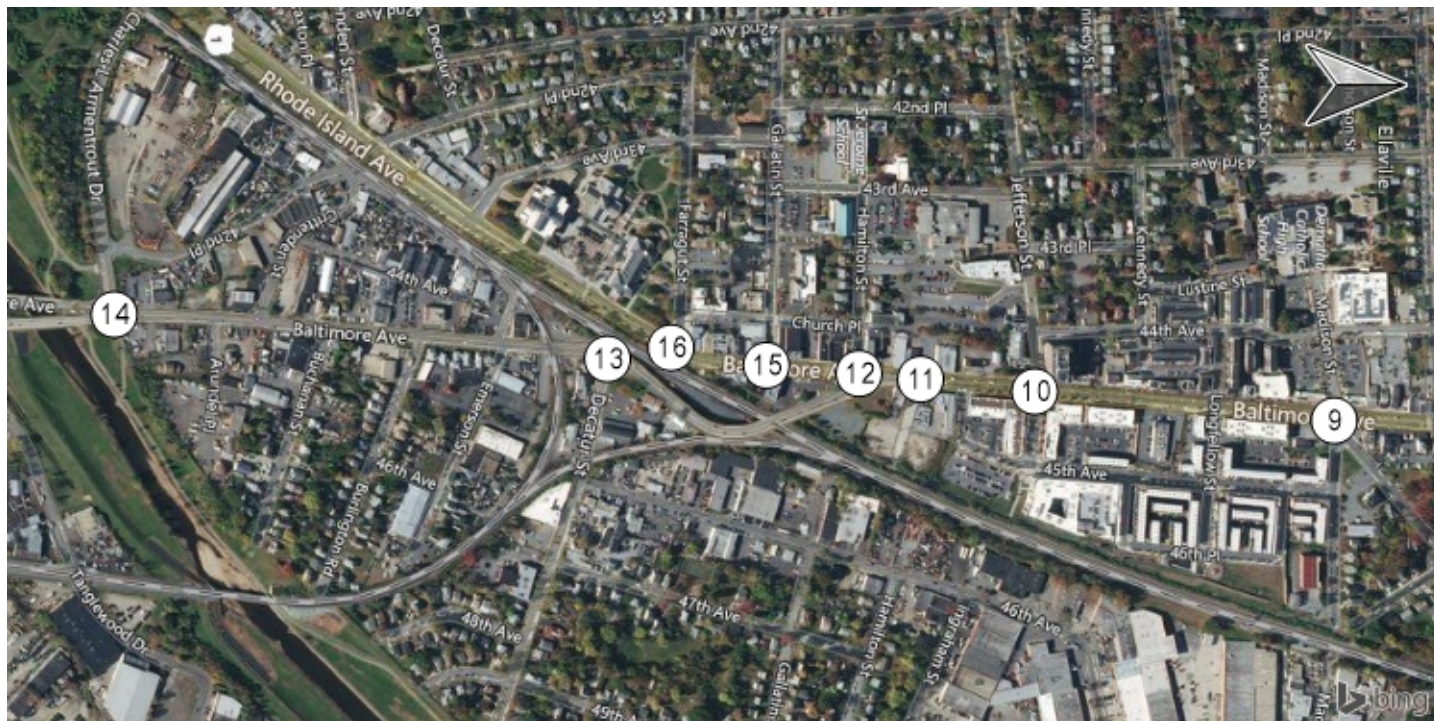
US 1/Queensbury Rd



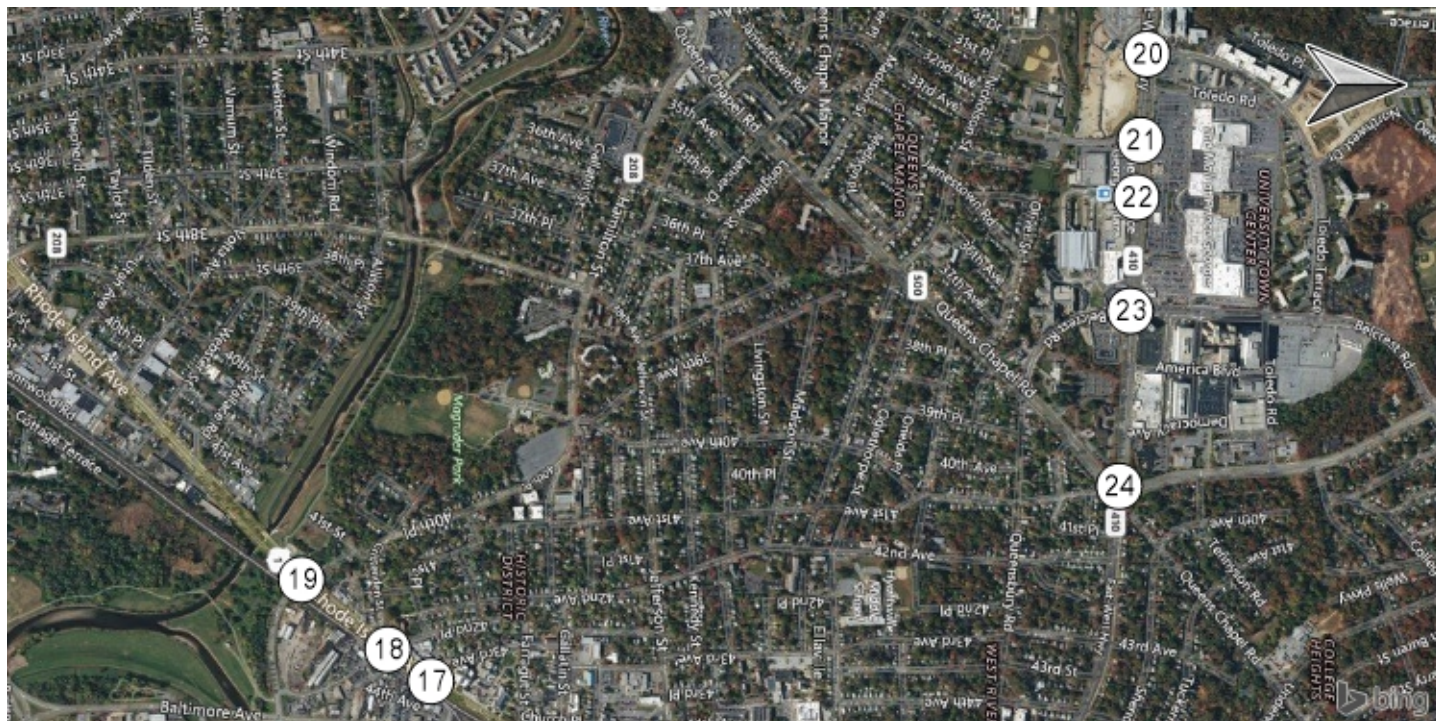
US 1/Oglethorpe Rd



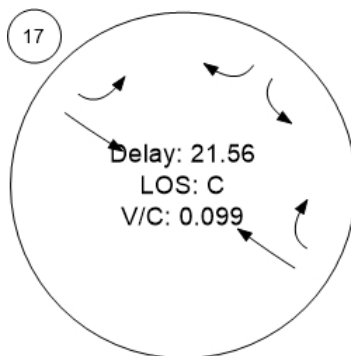
Traffic Conditions



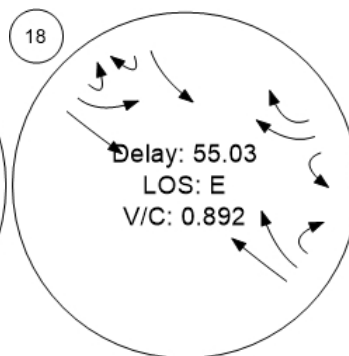
Traffic Conditions



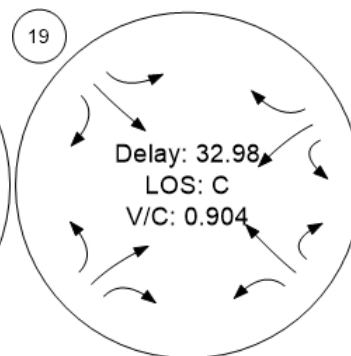
US 1/43rd Ave



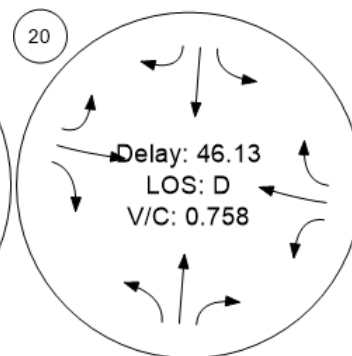
US 1/42nd Place/Crittendon



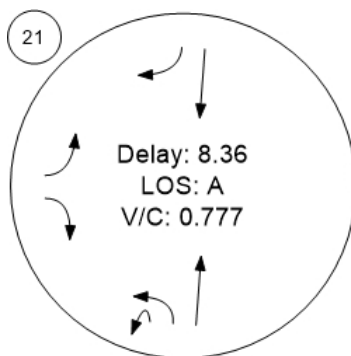
US 1/41st Place/Charles Arm



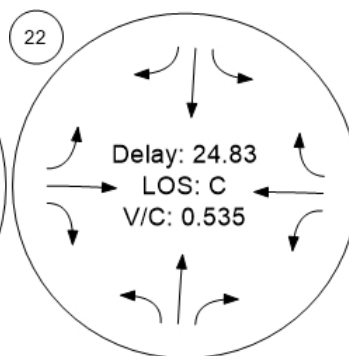
MD 410/Toledo Terrace



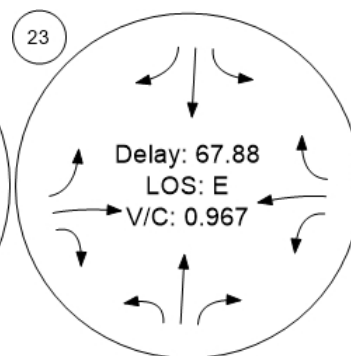
MD 410/Editors Park Dr



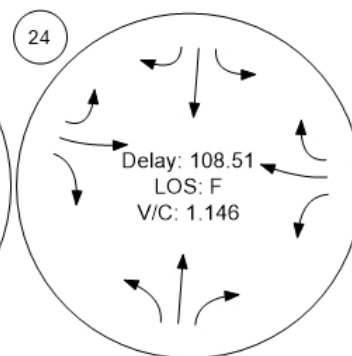
MD 410/Prince George's Plaz



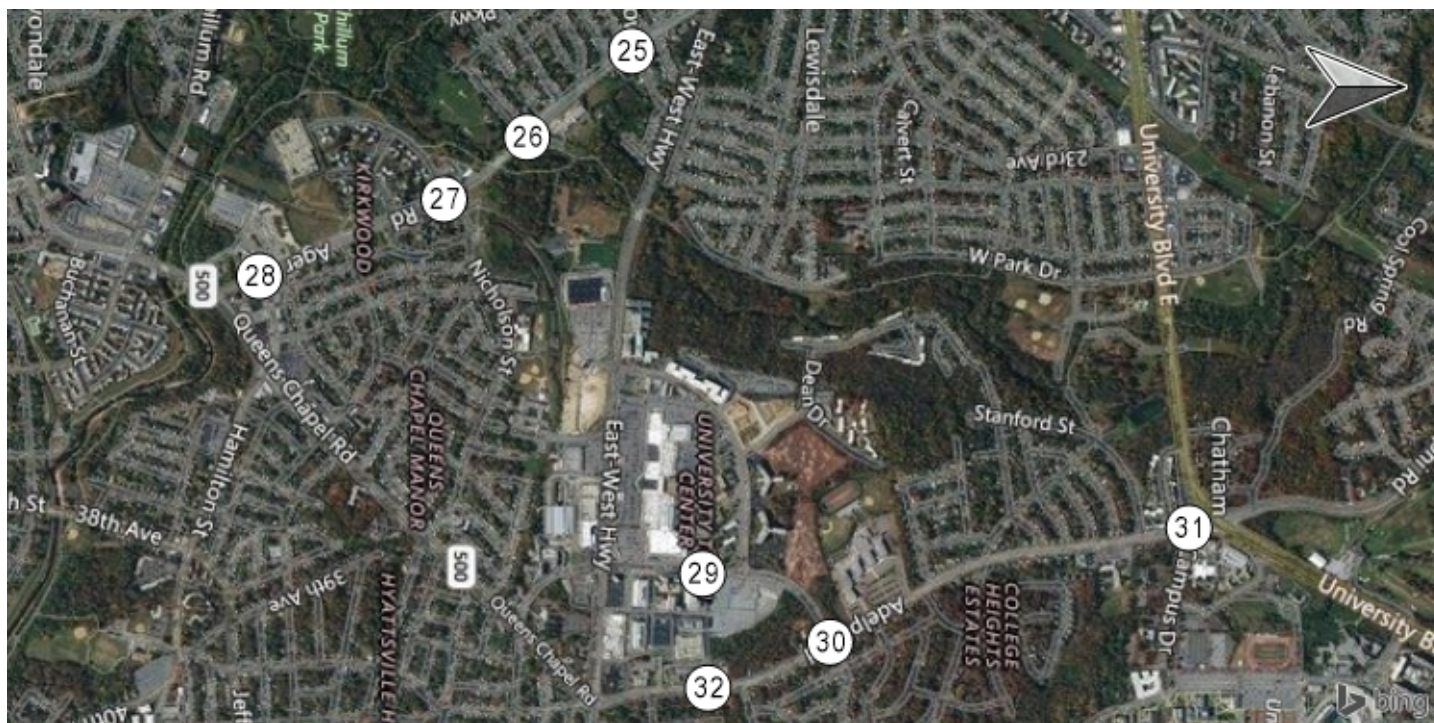
MD 410/Belcrest Rd



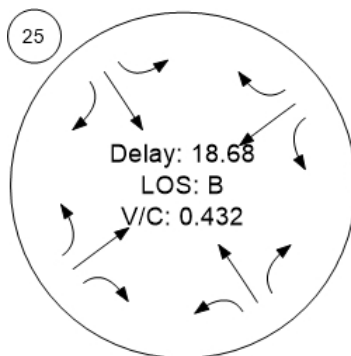
MD 410/MD 500/Adelphi Rd



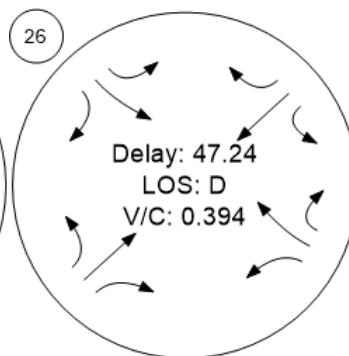
Traffic Conditions



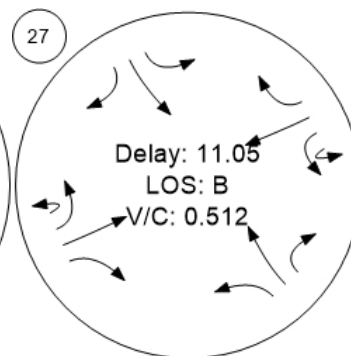
Ager Rd/23rd Ave



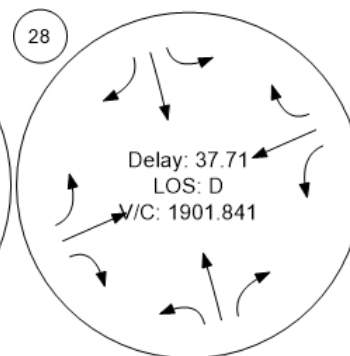
Ager Rd/Oglethorpe St/Scho



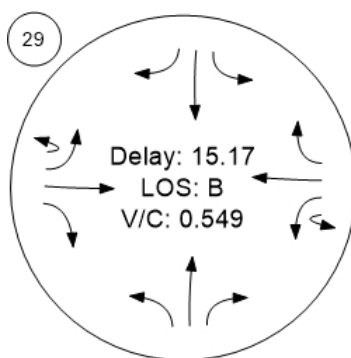
Ager Rd/Nicholson St



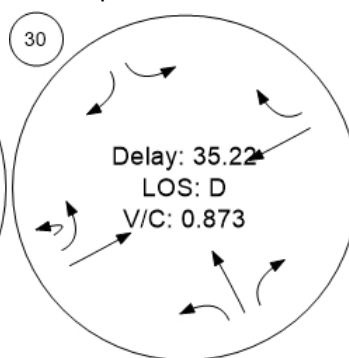
Ager Rd/Hamilton St



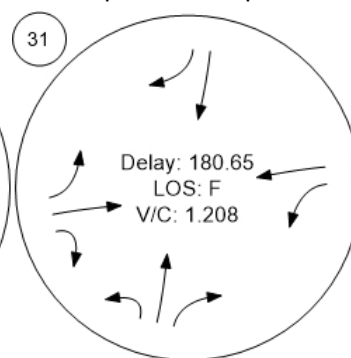
Toledo Rd/Belcrest Rd



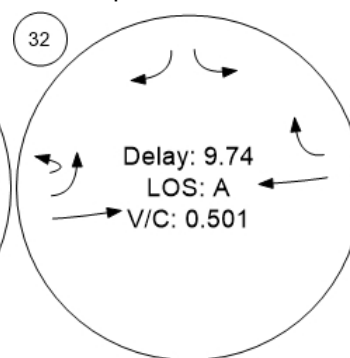
Adelphi Rd/Belcrest Rd



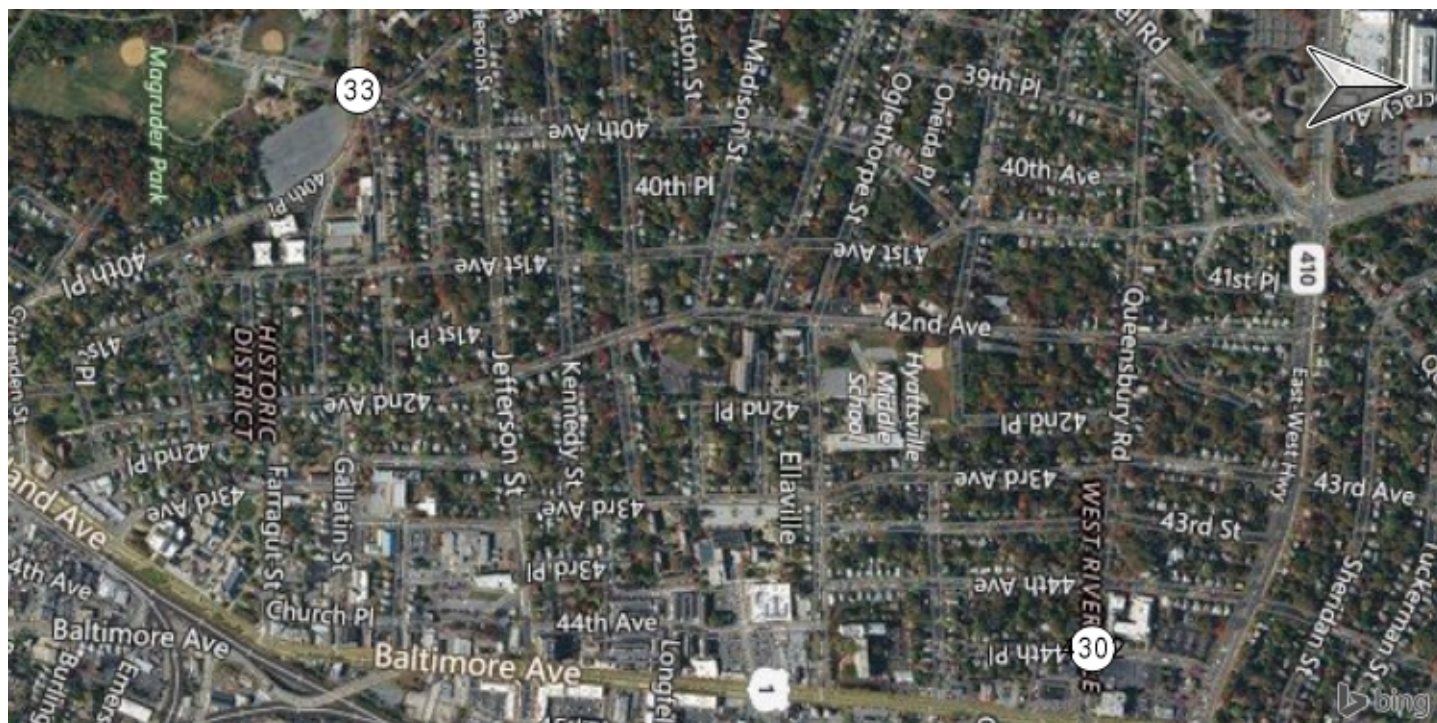
Adelphi Rd/Campus Dr



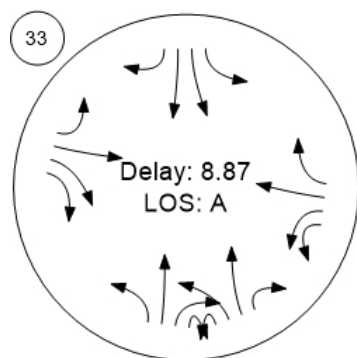
Adelphi Rd/Toledo Rd



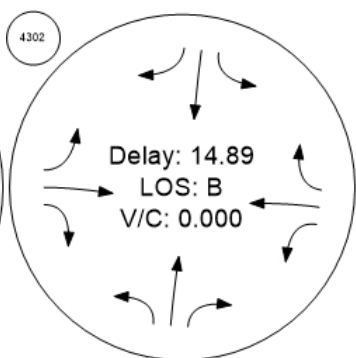
Traffic Conditions



Hamilton St/40th Pl/39th Ave



New Intersection



Hyattsville Transportation Plan

Vistro File: K:\...\2037 PM No Build.vistro

Scenario: Base Scenario

Report File: K:\...\2037 PM_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	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

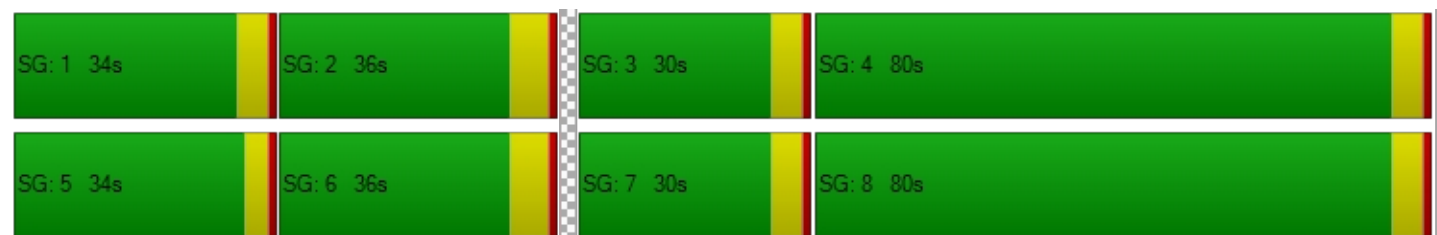
X, volume / capacity	0.39	0.86	0.43	0.76	0.49	0.25	0.63	0.89	0.89	0.70	0.73	0.13
d, Delay for Lane Group [s/veh]	21.69	44.16	29.51	62.78	28.58	24.53	56.00	76.52	76.97	51.66	68.45	58.78
Lane Group LOS	C	D	C	E	C	C	E	E	E	D	E	E
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue 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

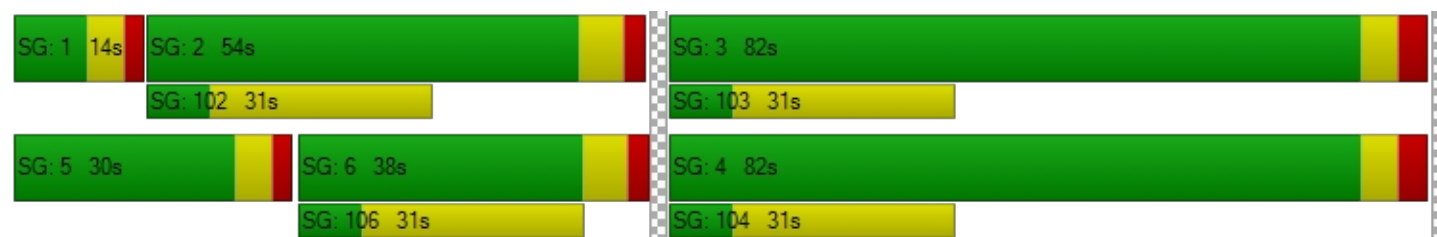
X, volume / capacity	1.35	0.44	0.86	0.57	0.79	0.81	0.11	0.60	0.60
d, Delay for Lane Group [s/veh]	237.57	31.75	55.90	15.31	29.27	30.69	16.28	29.69	29.76
Lane Group LOS	F	C	E	B	C	C	B	C	C
Critical Lane Group	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.40	4.96	10.49	3.56	15.55	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

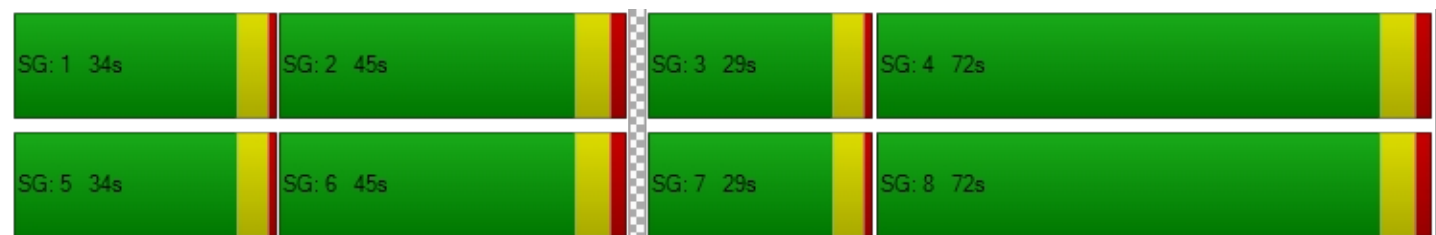
X, volume / capacity	0.86	0.73	0.73	0.70	1.09	1.10	1.65	1.41	0.76	1.15	0.92	0.92
d, Delay for Lane Group [s/veh]	61.69	70.46	70.98	52.04	138.32	142.81	388.15	245.41	59.58	182.97	66.14	75.65
Lane Group LOS	E	E	E	D	F	F	F	F	E	F	E	E
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile 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
Analysis Method: HCM 2010
Analysis Period: 15 minutes

Delay (sec / veh): 10.1
Level Of Service: B
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

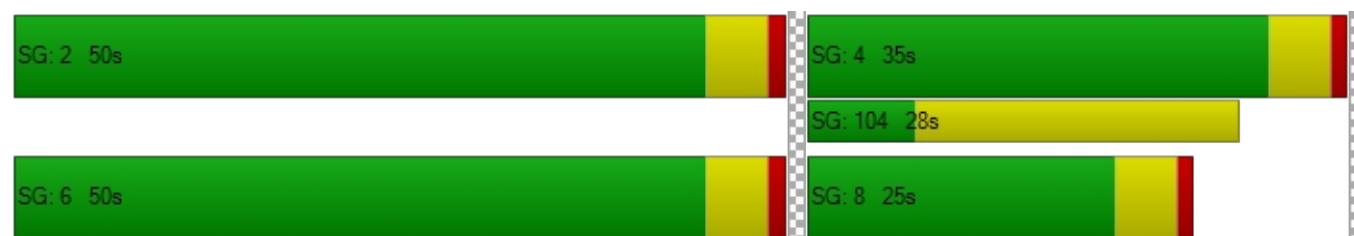
d_M, Delay for Movement [s/veh]	28.79	28.79	28.79	28.13	28.13	28.13	23.43	15.44	15.44	19.95	17.52	17.52
Movement LOS	C	C	C	C	C	C	C	B	B	B	B	B
d_A, Approach Delay [s/veh]	28.79			28.13			15.69			17.59		
Approach LOS	C			C			B			B		
d_I, Intersection Delay [s/veh]	18.68											
Intersection LOS	B											
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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

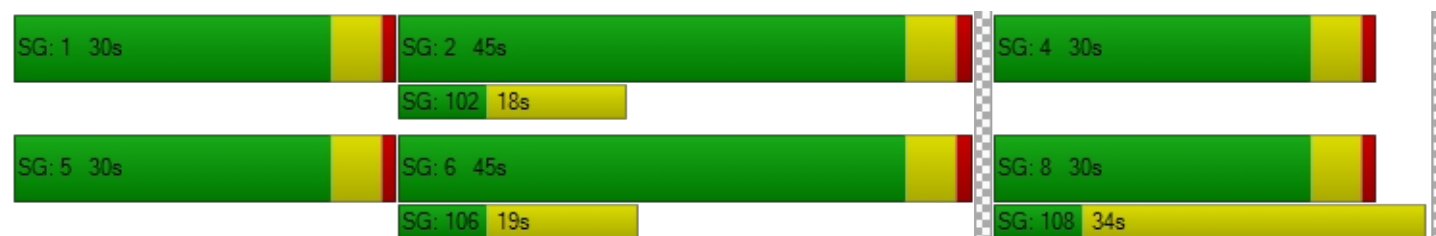
d_M, Delay for Movement [s/veh]	34.38	34.38	34.38	32.45	32.45	32.45	13.85	42.89	42.89	11.08	53.40	53.51
Movement LOS	C	C	C	C	C	C	B	D	D	B	D	D
d_A, Approach Delay [s/veh]	34.38			32.45			41.49			53.29		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	47.24											
Intersection LOS	D											
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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

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

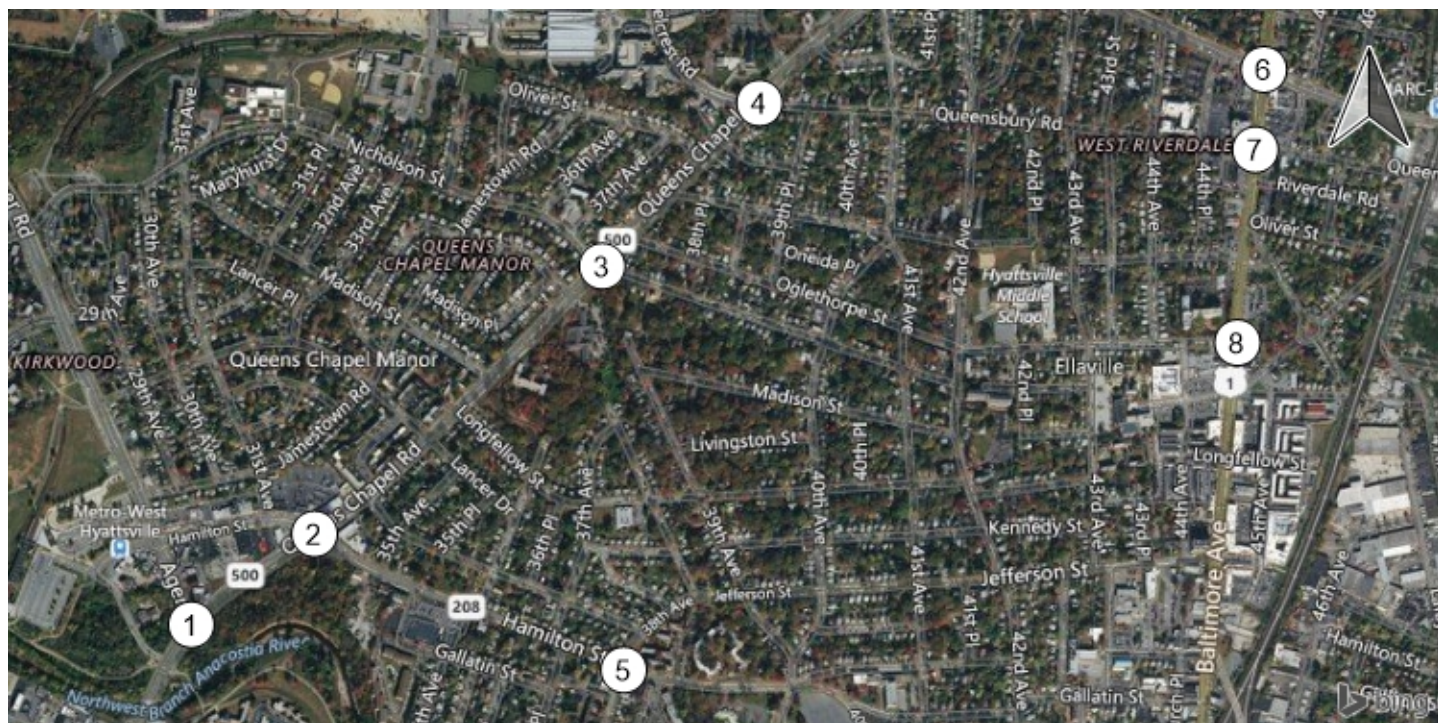
Lanes

Capacity per Entry Lane [veh/h]	544	676
Degree of Utilization, x	0.15	0.76

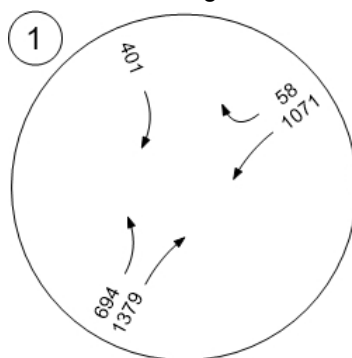
Movement, Approach, & Intersection Results

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	

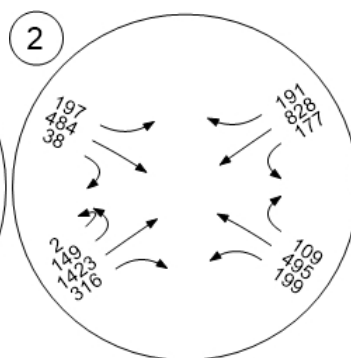
Traffic Volume - Future Total Volume



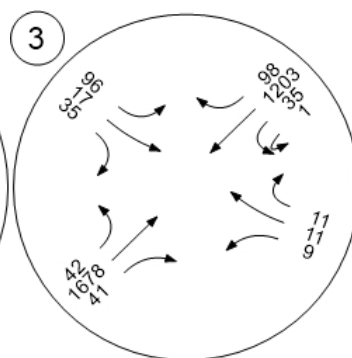
MD 500/Ager Rd



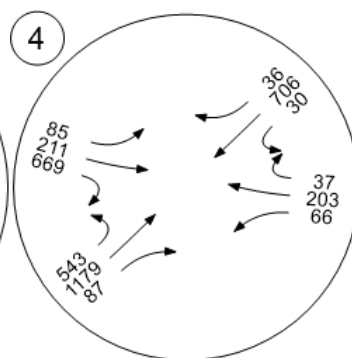
MD 500/Hamilton St



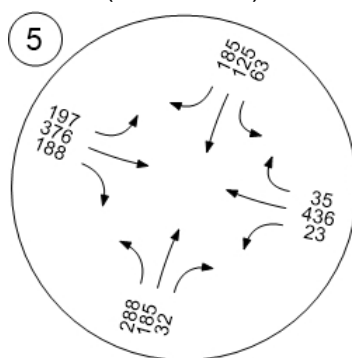
MD 500/Nicholson St



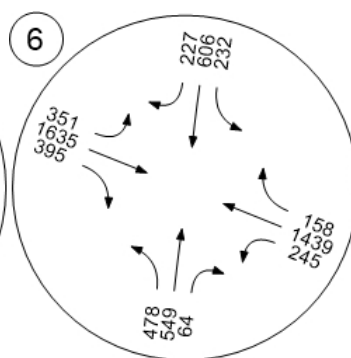
MD 500/Belcrest Rd/Queens



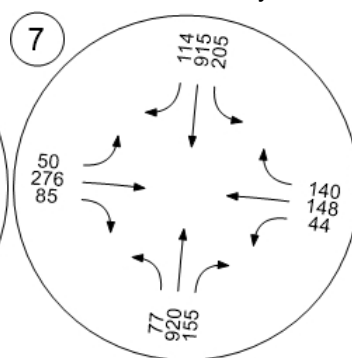
MD 208(Hamilton St)/38th Av



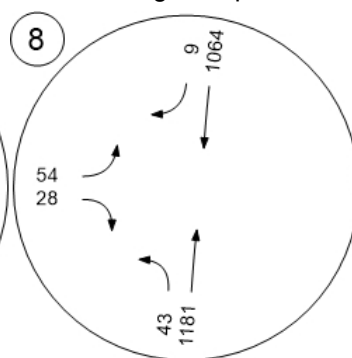
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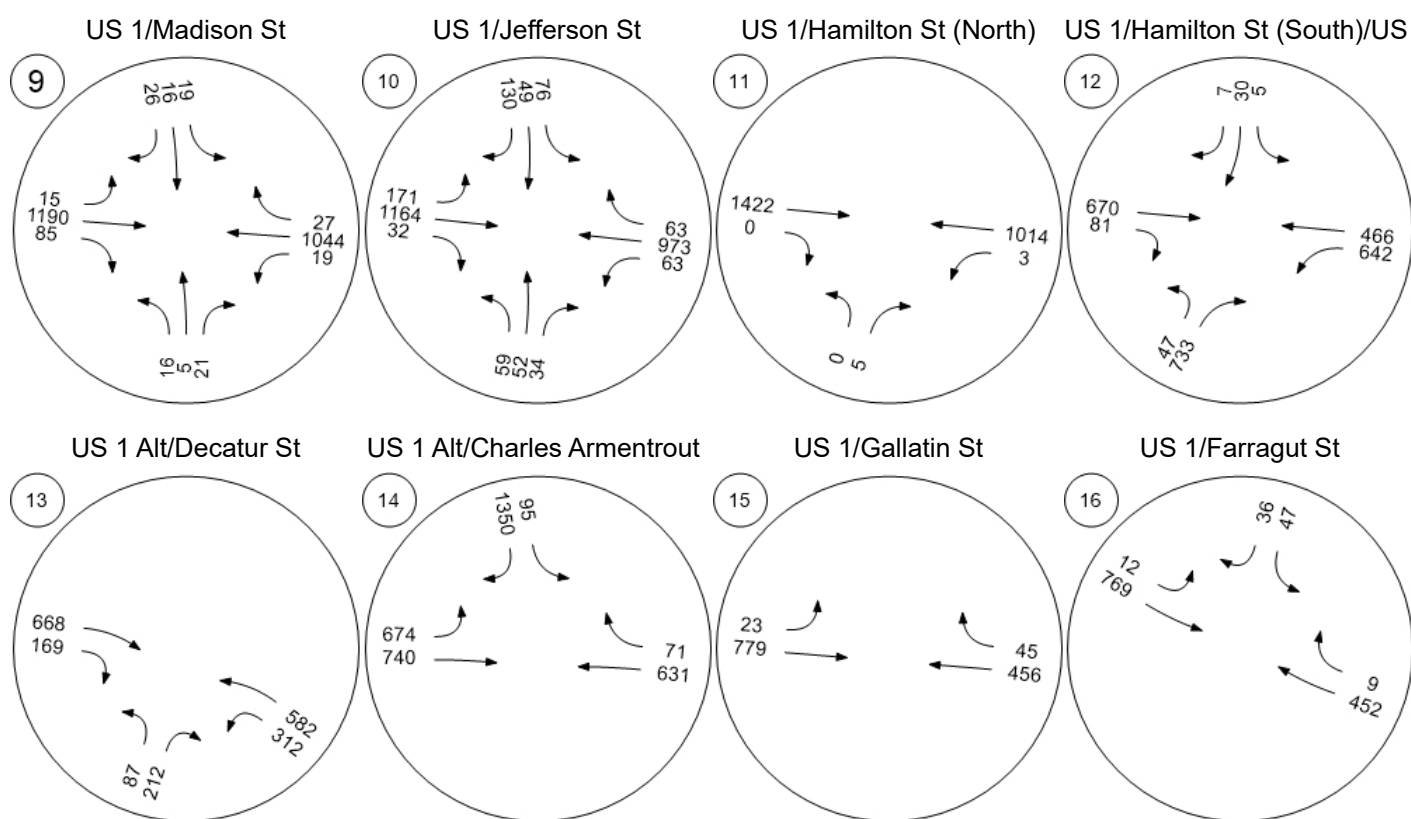
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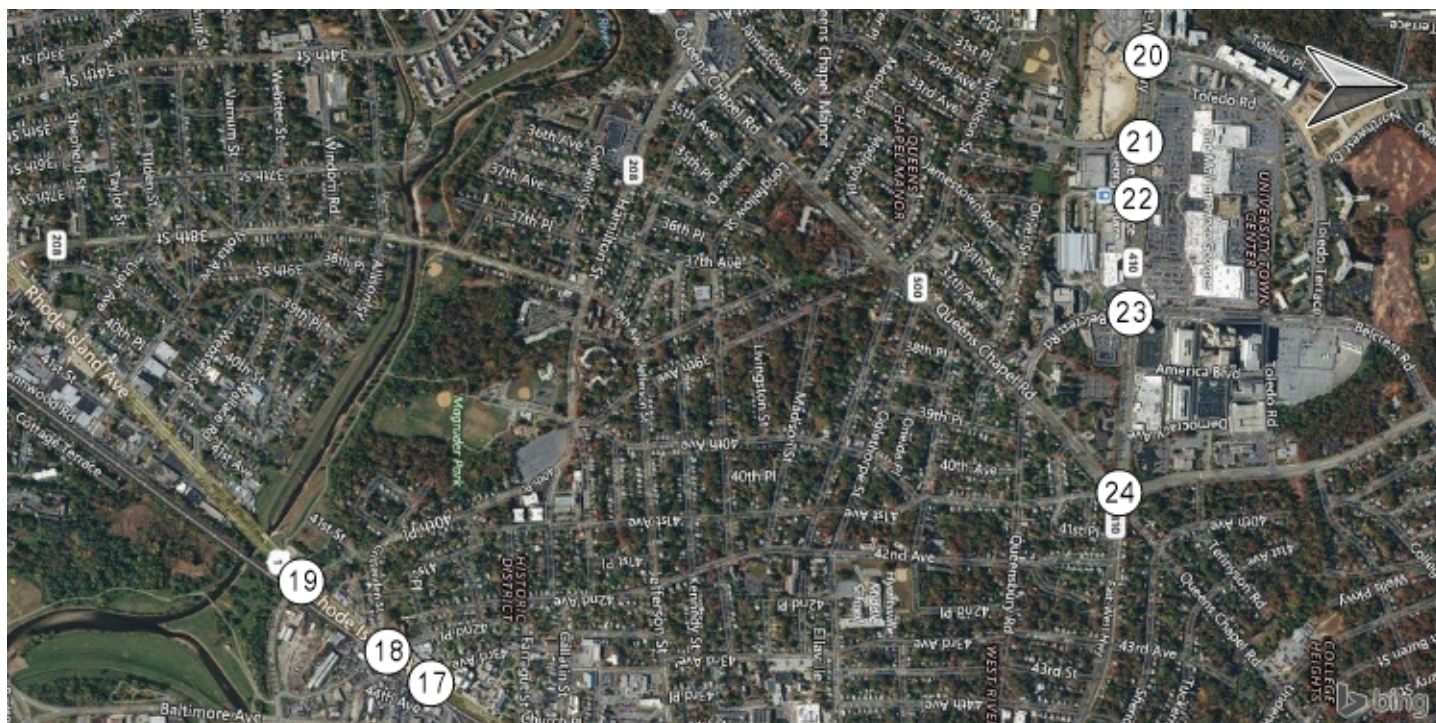


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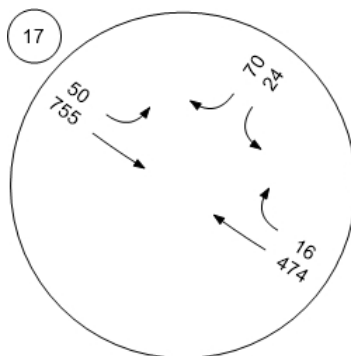


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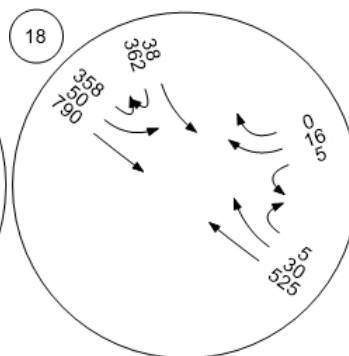
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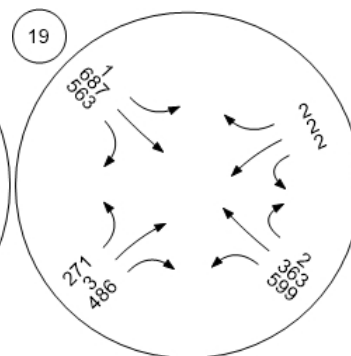
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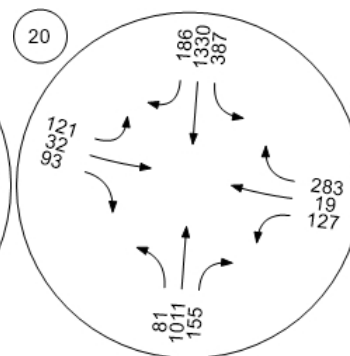
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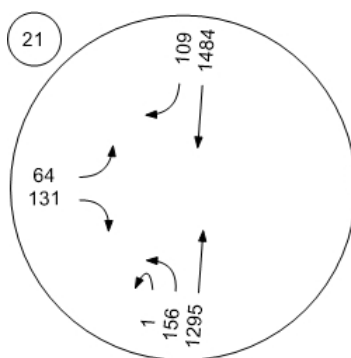
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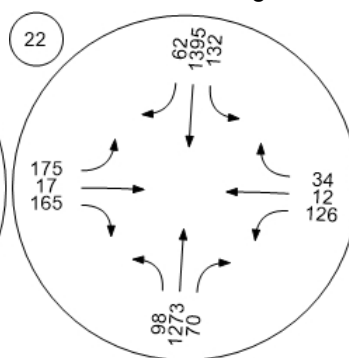
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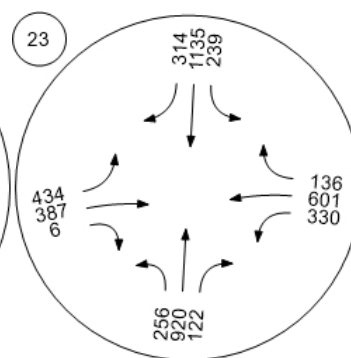
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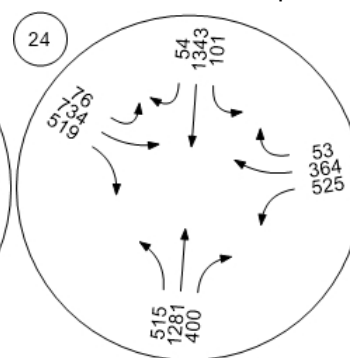
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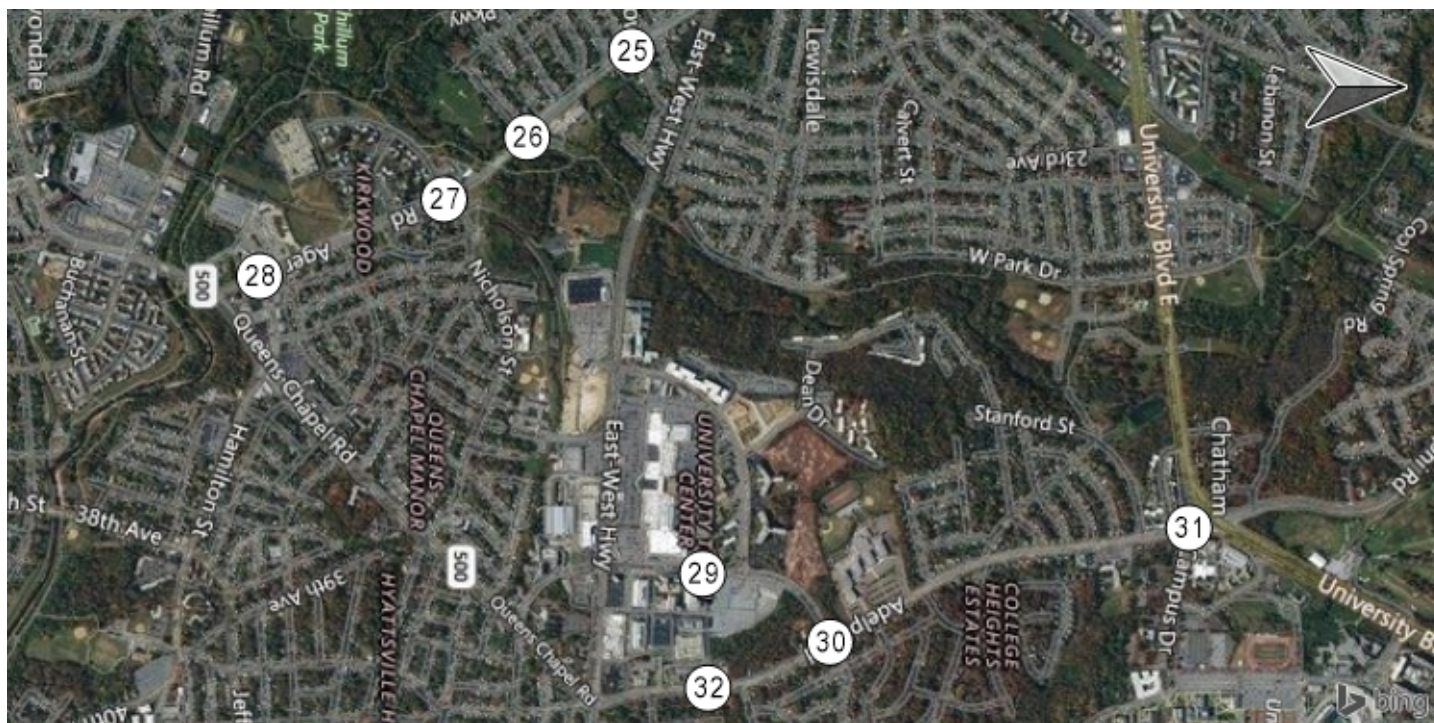
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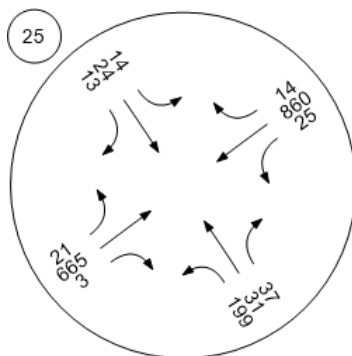
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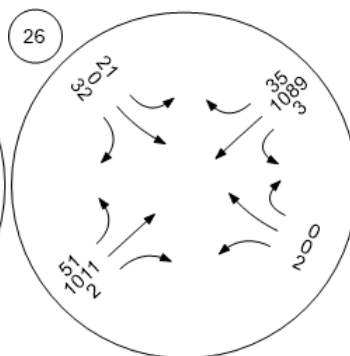
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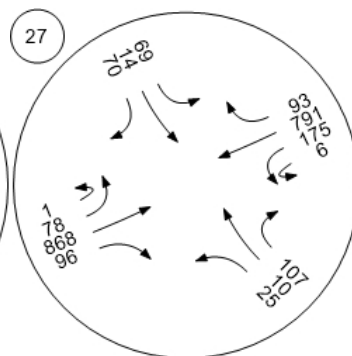
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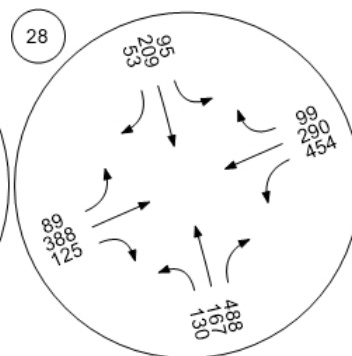
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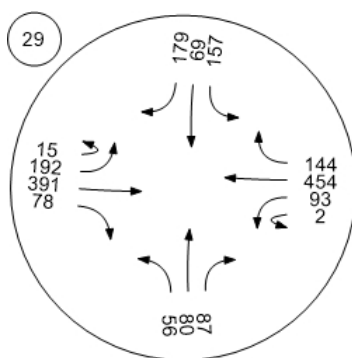
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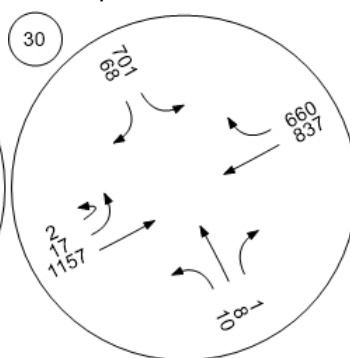
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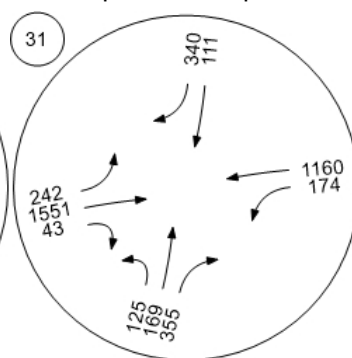
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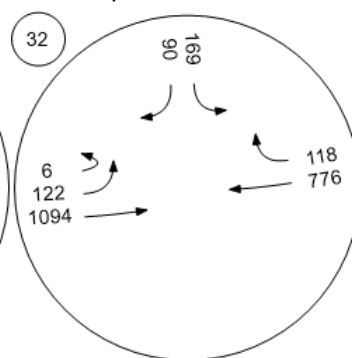
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Adelphi Rd/Campus Dr



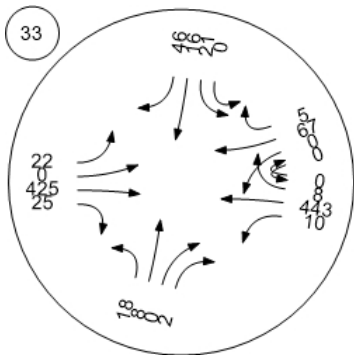
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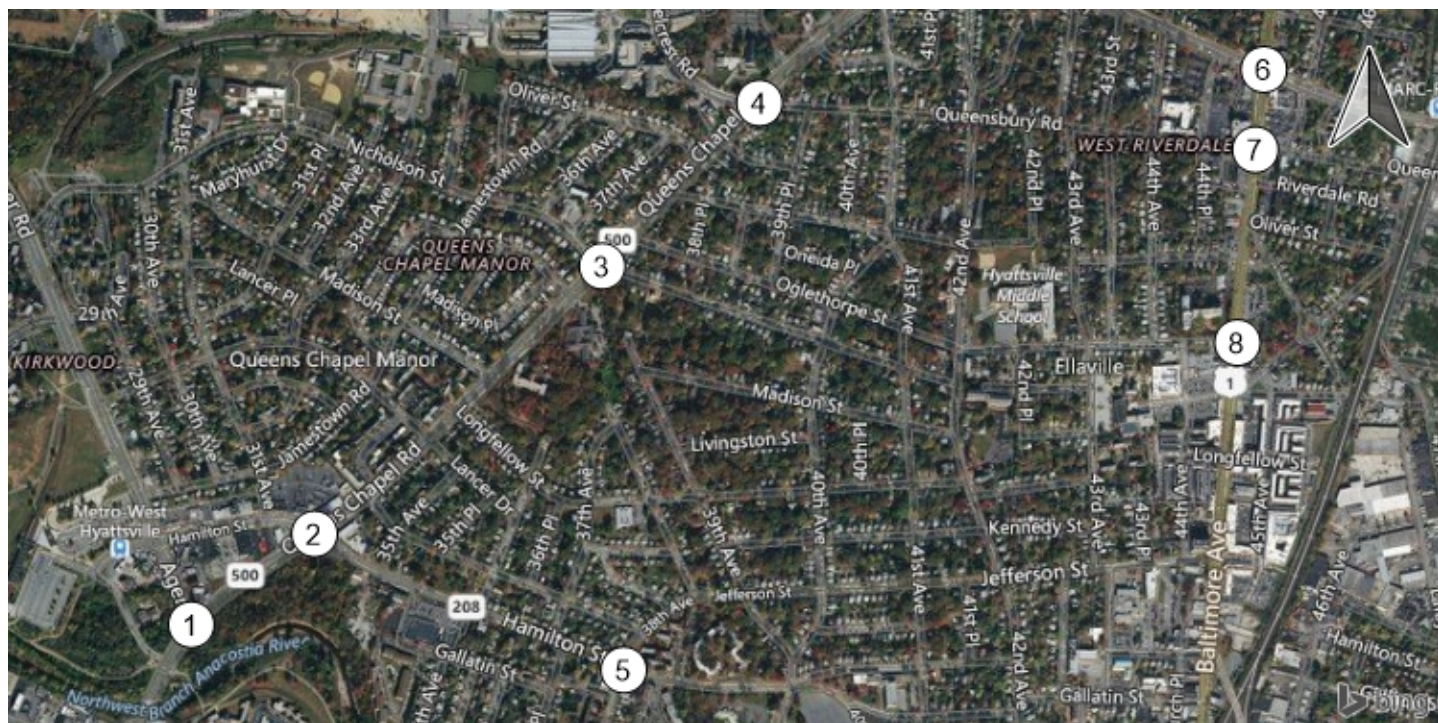
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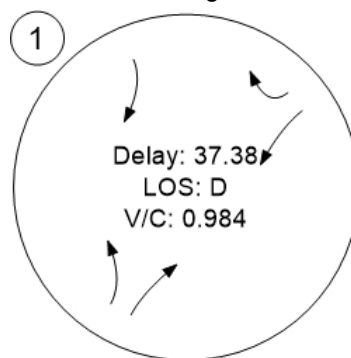
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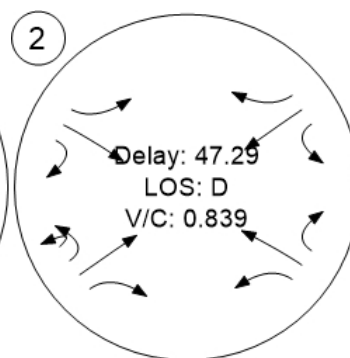
Traffic Conditions



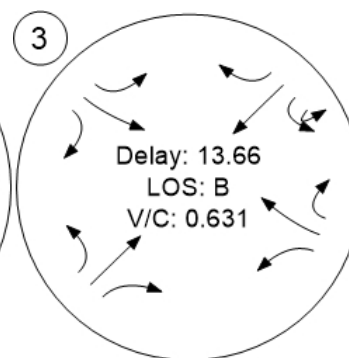
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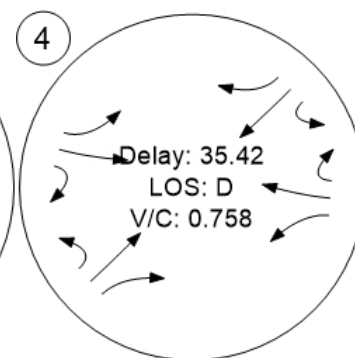
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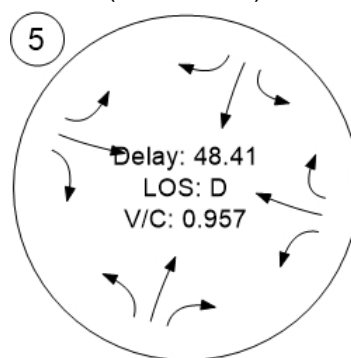
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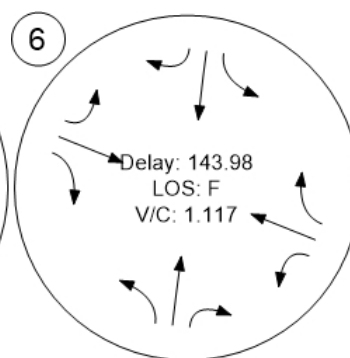
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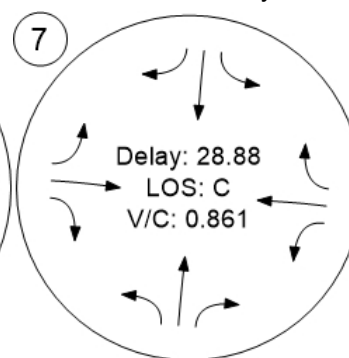
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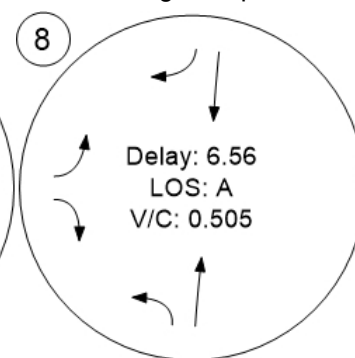
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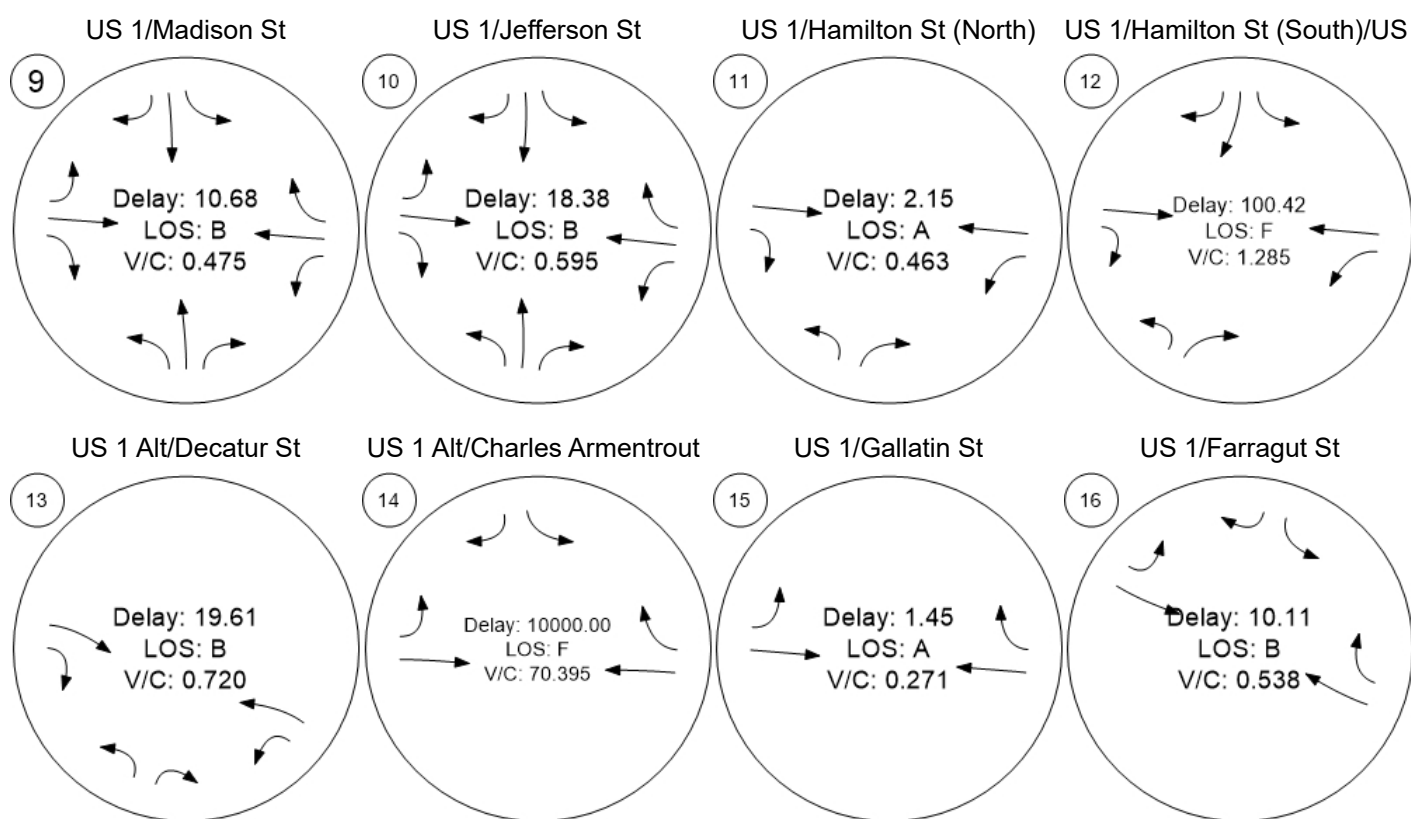
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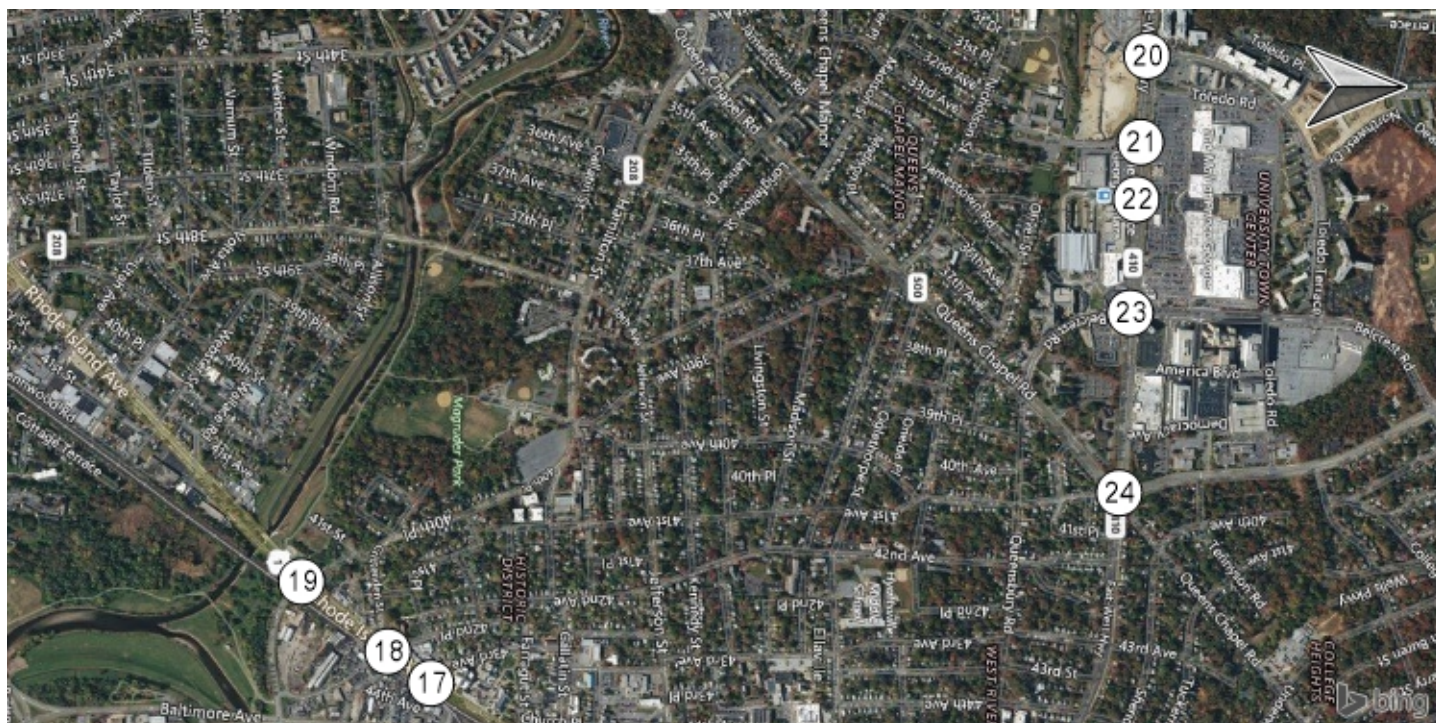
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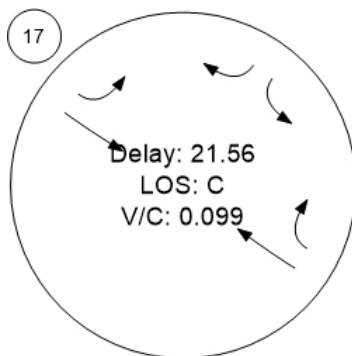
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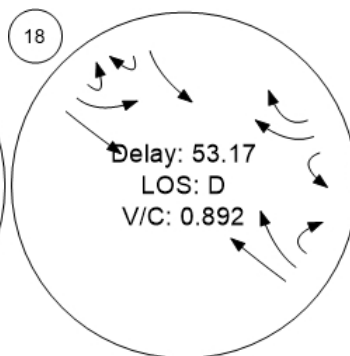
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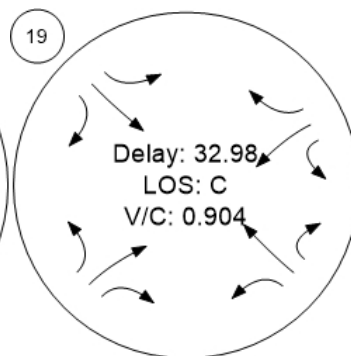
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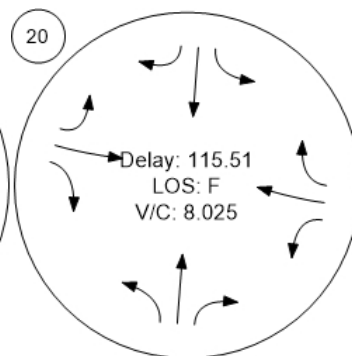
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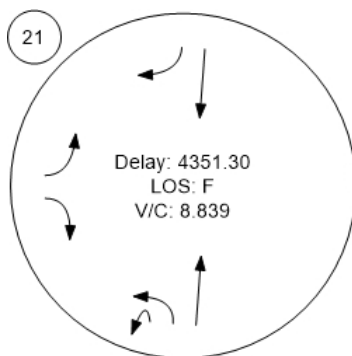
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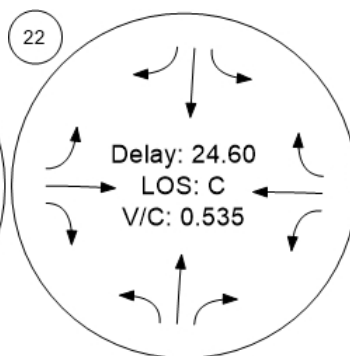
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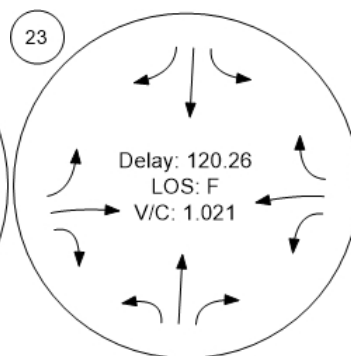
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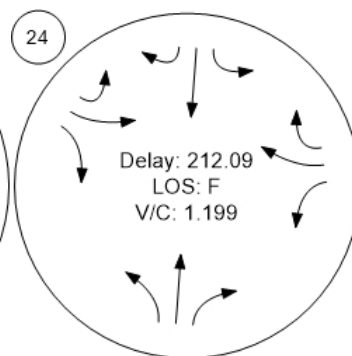
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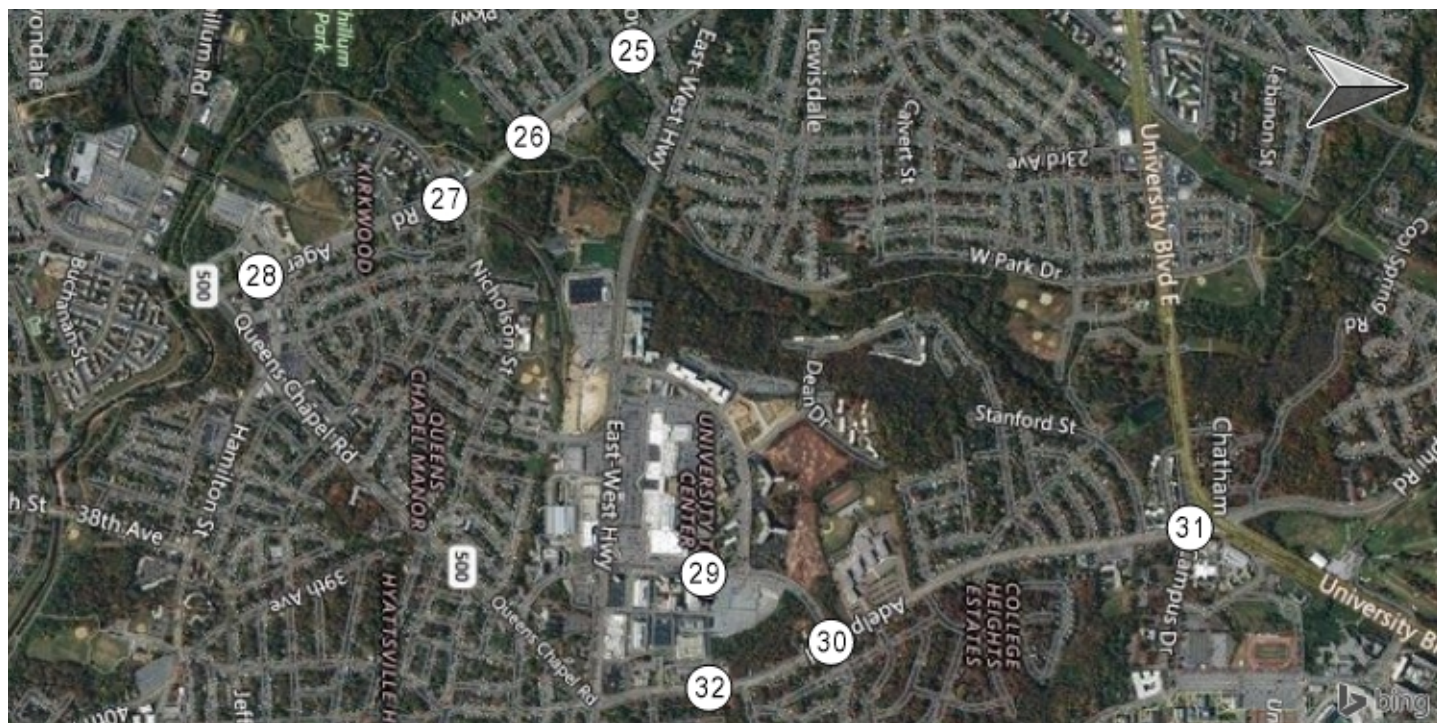
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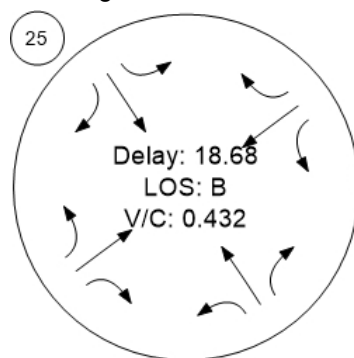
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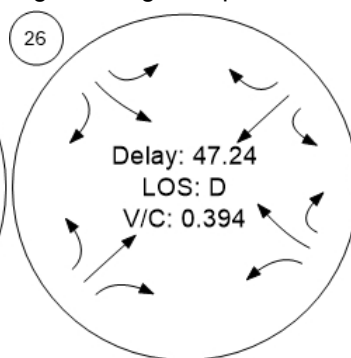
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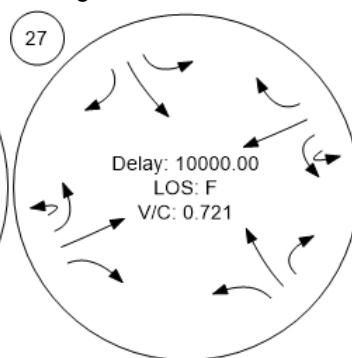
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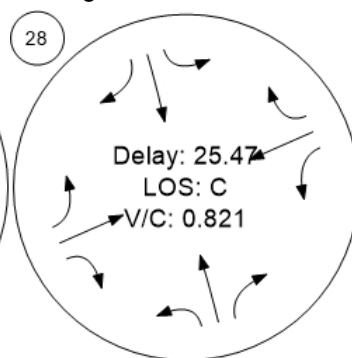
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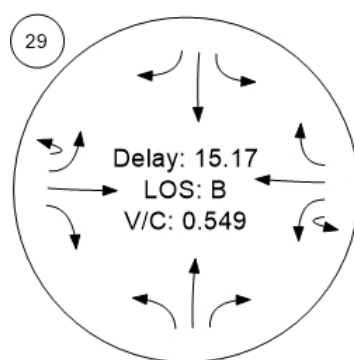
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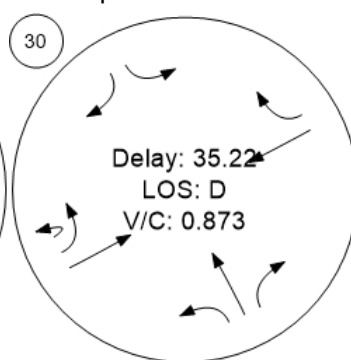
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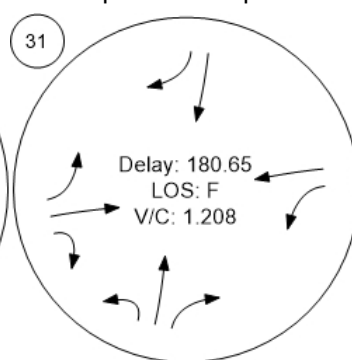
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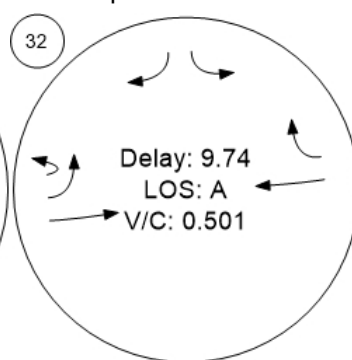
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Adelphi Rd/Campus Dr



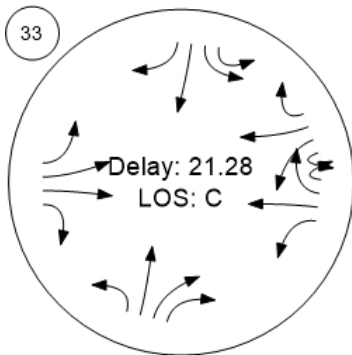
Adelphi Rd/Toledo Rd



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.

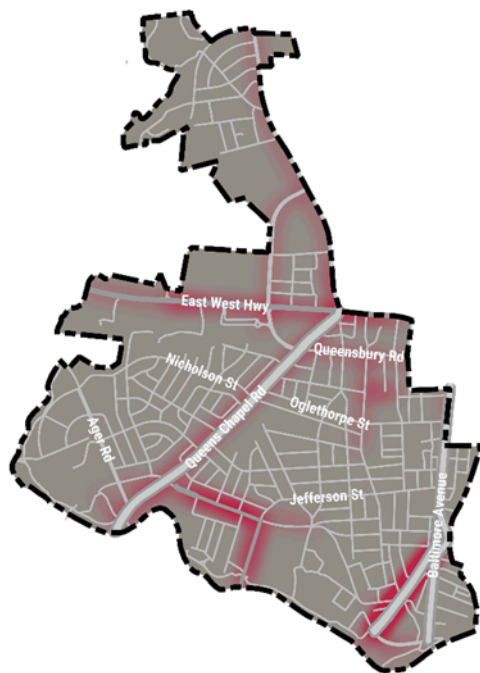


Figure 1: Difficult Routes for Walking and Biking

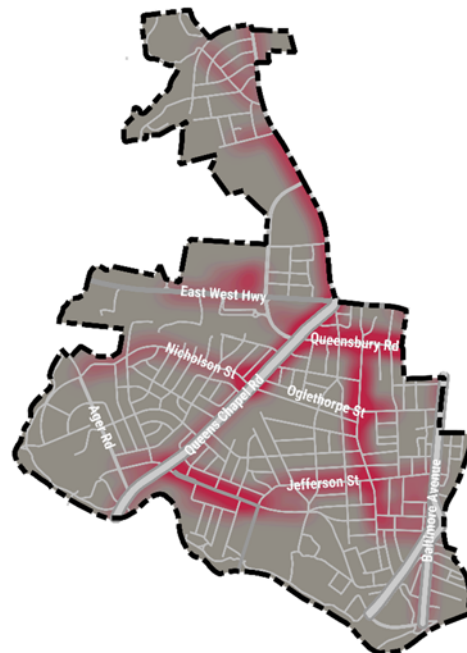


Figure 2: High Traffic Corridors

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.

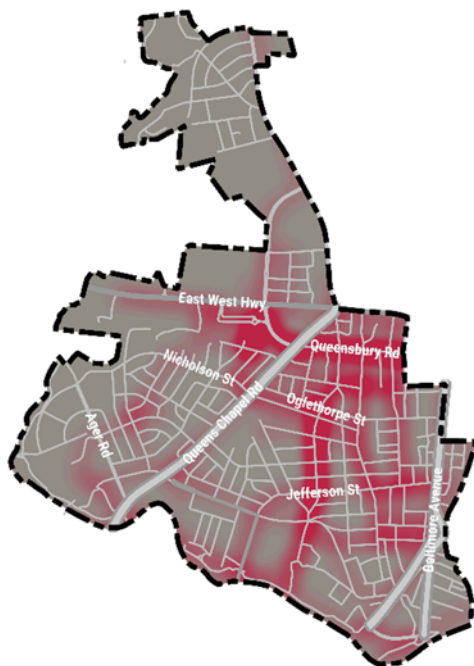


Figure 3: Routes Users Walk and Bike

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

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

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		
- THROUGH (T) - LEFT (L) - DIAGONAL LEFT (DL) - ADVANCE TURN ARROW "THROUGH-LEFT" (TL) - RIGHT (R) - DIAGONAL RIGHT (DR) ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)																					
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		
- THROUGH (T) - LEFT (L) - DIAGONAL LEFT (DL) -ADVANCE TURN ARROW "THROUGH-LEFT" (TL) - RIGHT (R) - DIAGONAL RIGHT (DR) ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)																					
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		
- THROUGH (T) - LEFT (L) - DIAGONAL LEFT (DL) -ADVANCE TURN ARROW "THROUGH-LEFT" (TL) - RIGHT (R) - DIAGONAL RIGHT (DR) ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)																					
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		
- THROUGH (T) - LEFT (L) - DIAGONAL LEFT (DL) -ADVANCE TURN ARROW "THROUGH-LEFT" (TL) - RIGHT (R) - DIAGONAL RIGHT (DR) ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)																					
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 #		
- THROUGH (T) - LEFT (L) - DIAGONAL LEFT (DL) - ADVANCE TURN ARROW "THROUGH-LEFT" (TL) - RIGHT (R) - DIAGONAL RIGHT (DR) ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)																
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 #		
↑ ← ↙ - THROUGH (T) - LEFT (L) - DIAGONAL LEFT (DL) ↖ → ↘ -ADVANCE TURN ARROW "THROUGH-LEFT" (TL) - RIGHT (R) - DIAGONAL RIGHT (DR) ADVANCE TURN ARROW "THROUGH-RIGHT" (TR)																
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
	Magruder Park	0.8
Kiosk 3	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
	Edward M. Felegy Elementary School	0.7
Kiosk 4	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
	Hyattsville Middle School	0.9
	Heurich Park	1.2
Kiosk 5	West Hyattsville Metro Station	0.3
	Northwest Branch Trail	0.3
	Nicholas Orem Middle School	0.8
	Heurich Park	0.9

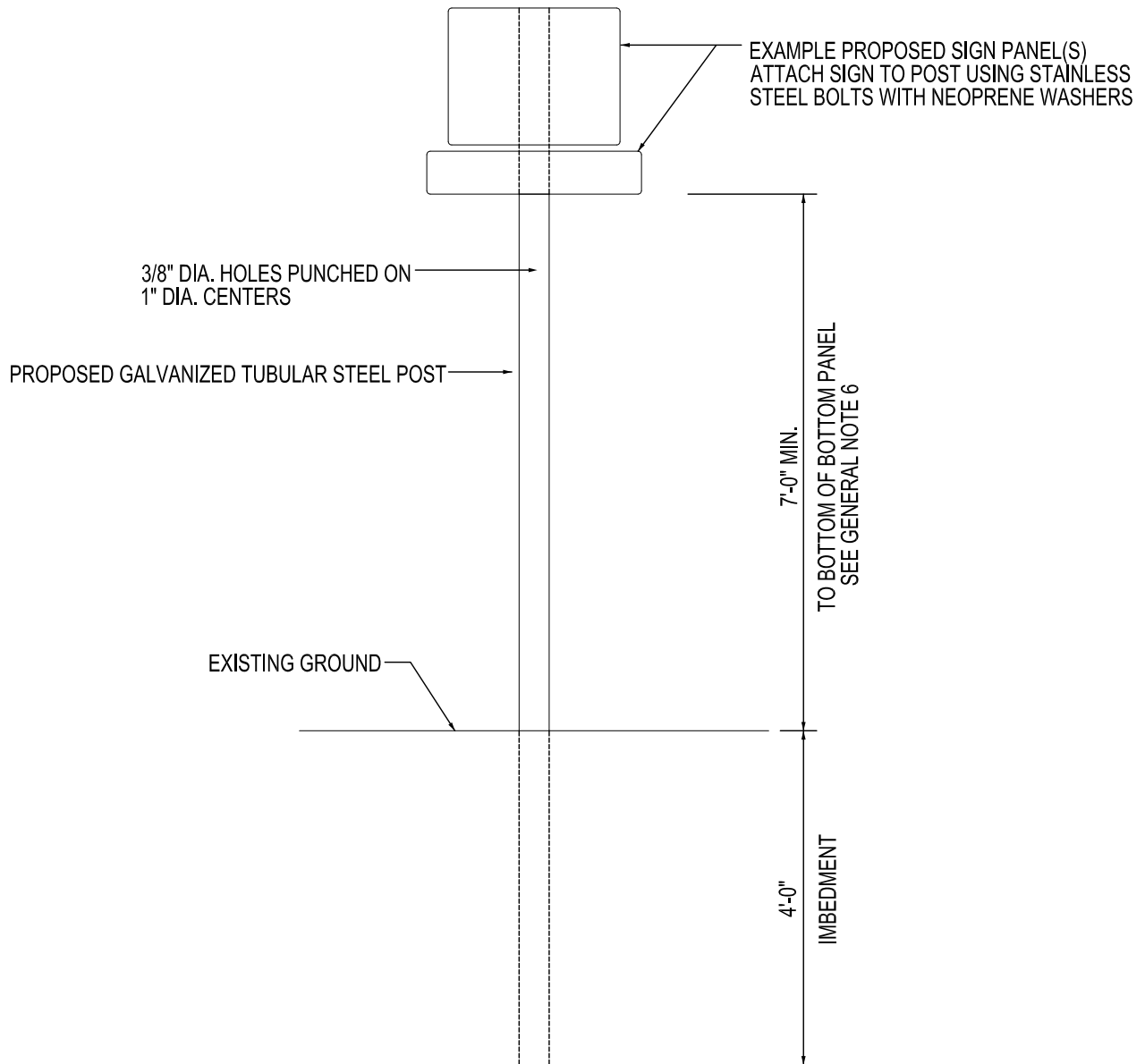
GENERAL NOTES

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.

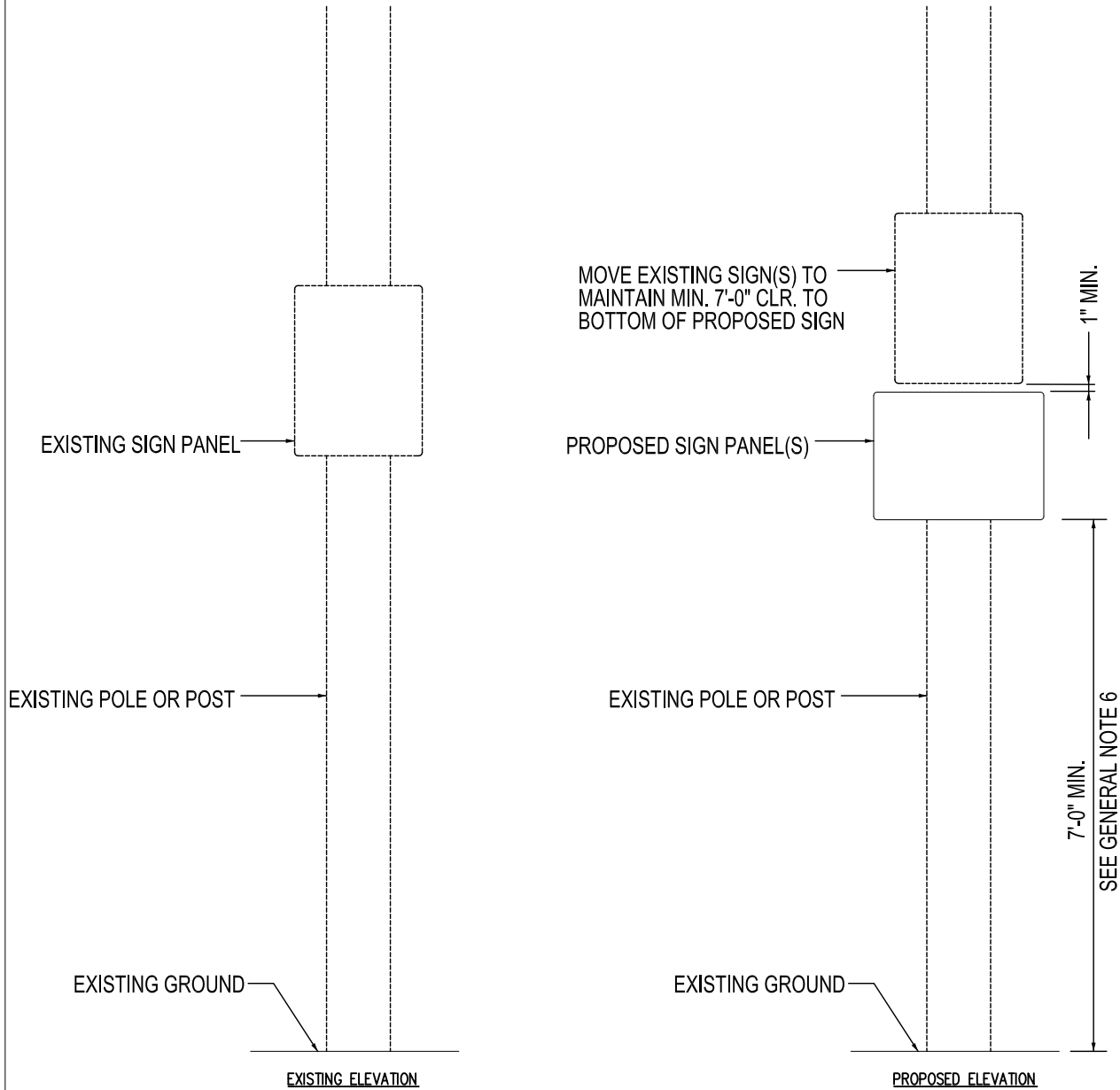
GENERAL NOTES

HYATTTSVILLE 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.

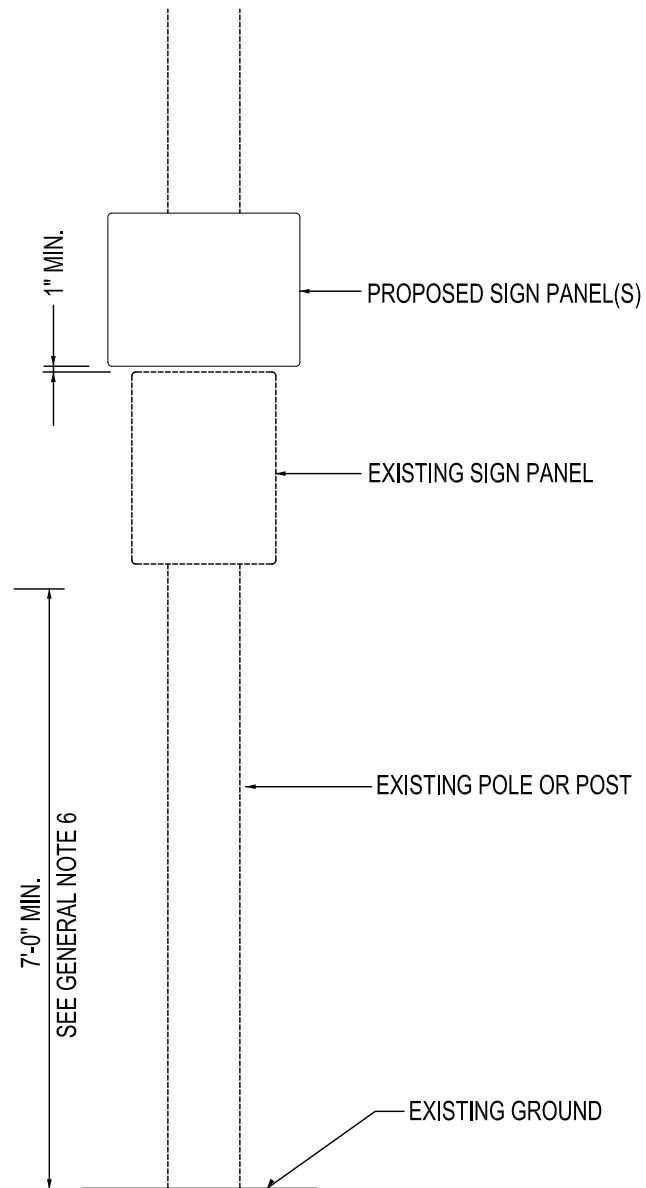
GENERAL NOTES

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.

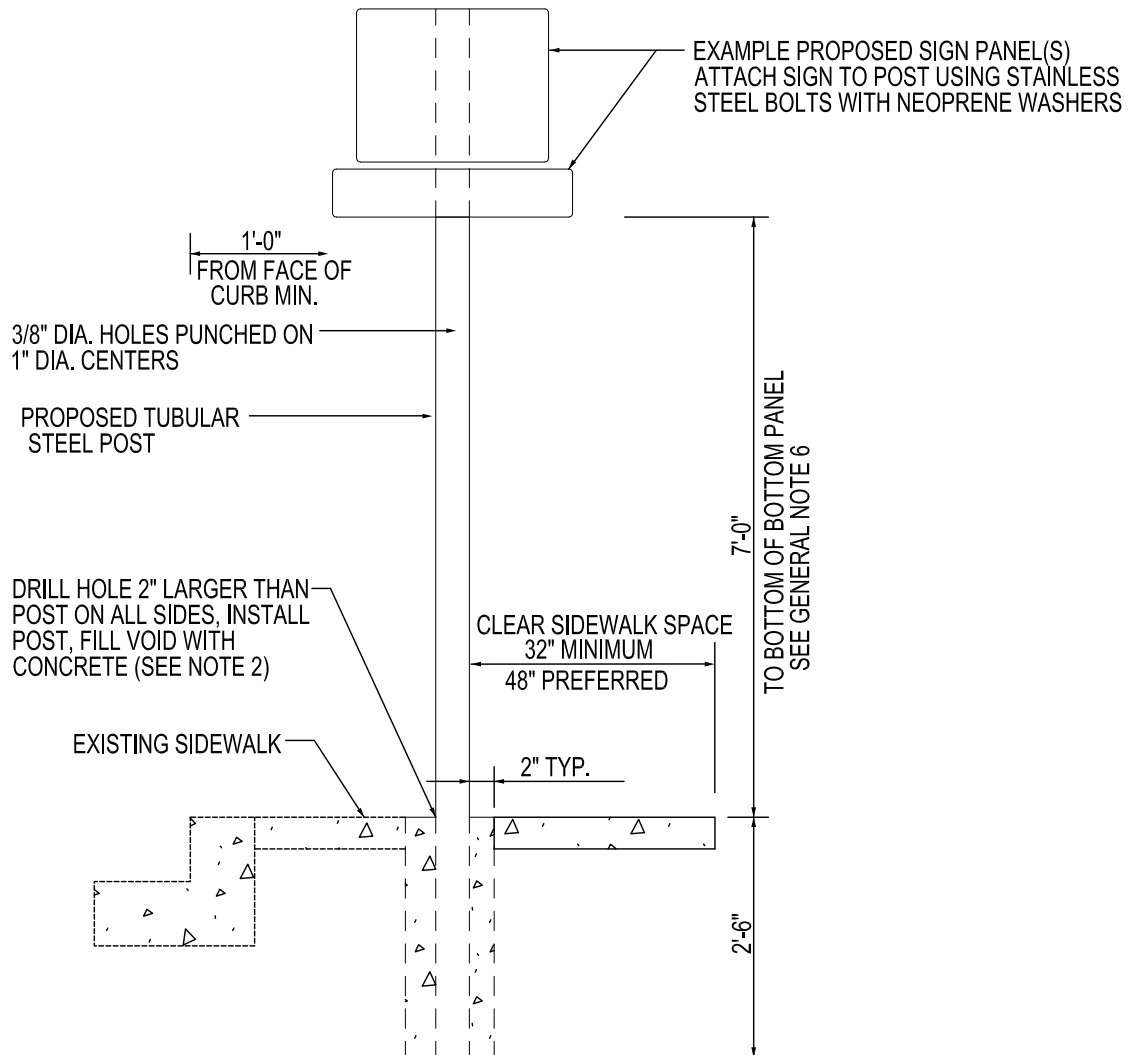
GENERAL NOTES

HYATTSVILLE WAYFINDING
SIGN TYPICAL DETAIL - 3
MOUNTING ABOVE EXISTING SIGNS

SHEET 5 OF 6
N.T.S.

ELEVATION

PROPOSED POST AND SIGN INSTALLATION IN EXISTING SIDEWALK 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.

2. CONCRETE SHALL CONFORM TO MARYLAND STATE HIGHWAY ADMINISTRATION STANDARDS AND SPECIFICATIONS FOR CONCRETE SIDEWALKS.

GENERAL NOTES

HYATTSVILLE WAYFINDING
SIGN TYPICAL DETAIL - 4
MOUNTING IN EXISTING SIDEWALK

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 -

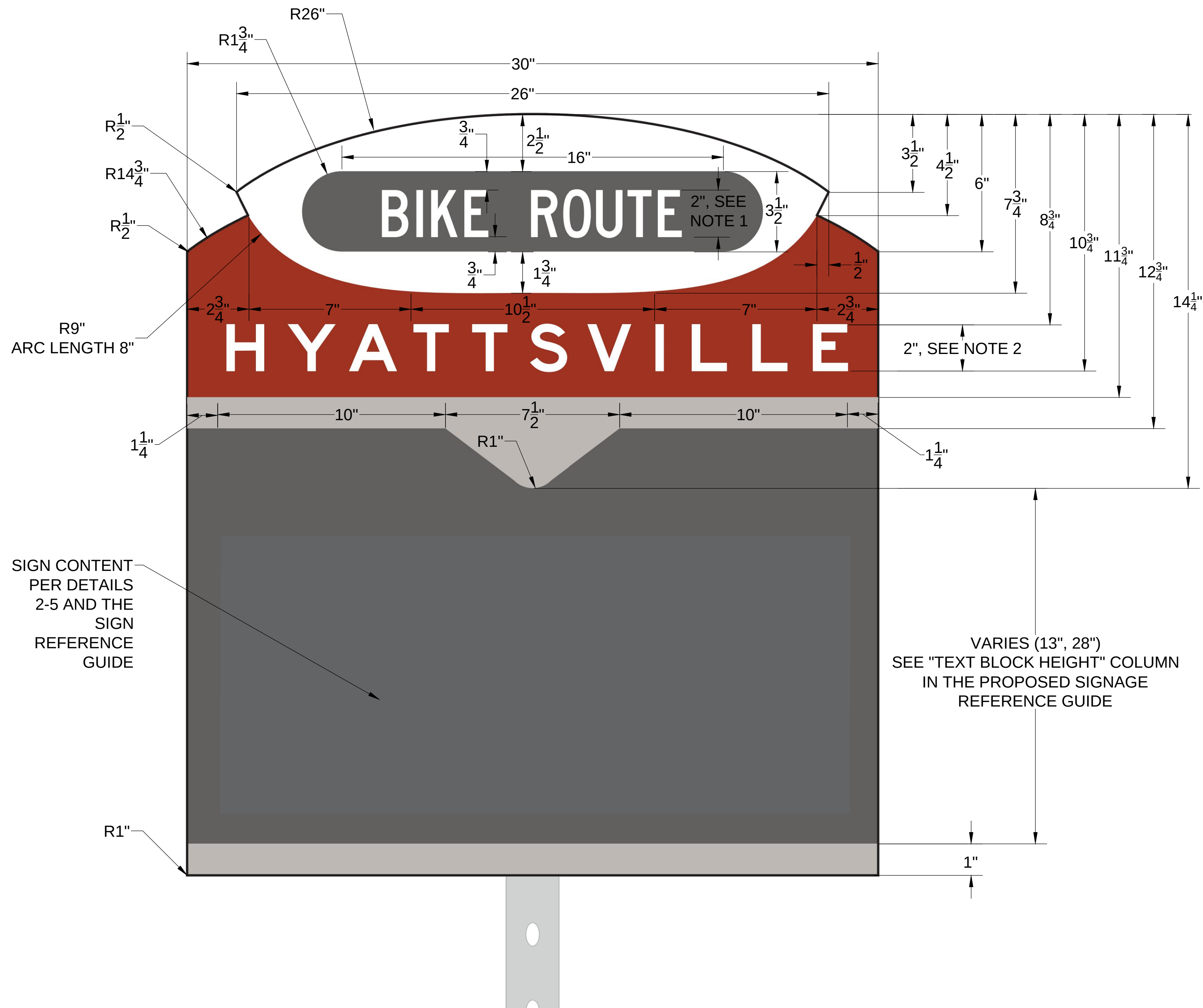
SHEET NAME
BICYCLE WAYFINDING
DETAILS

DRAWING NUMBER

B-1

SHEET NUMBER

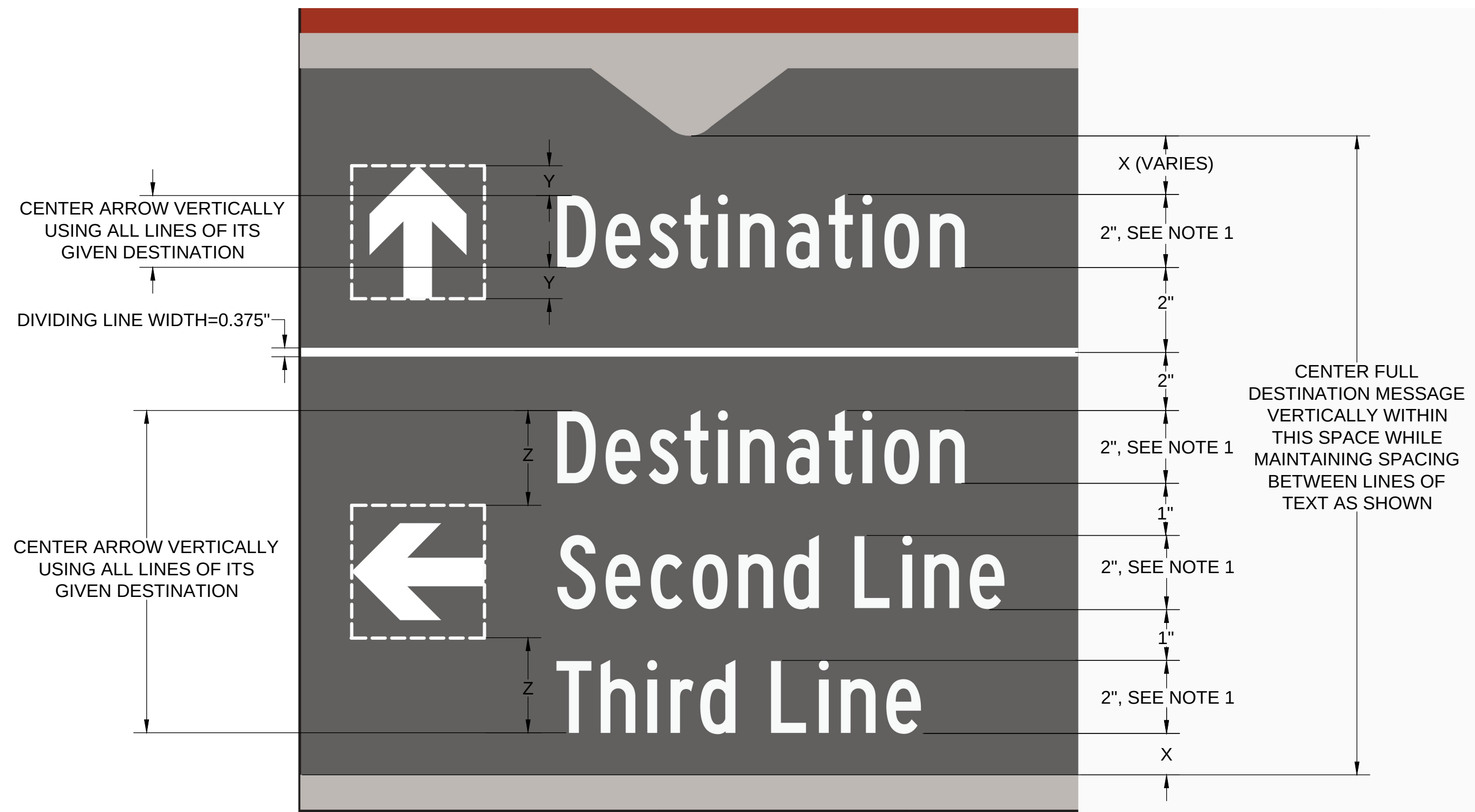
2 OF **10**



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
 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.

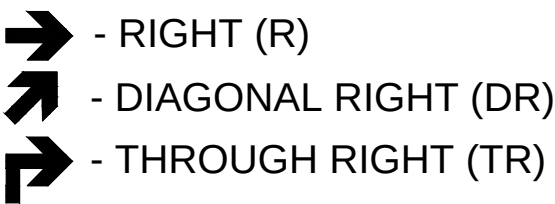
ARROW LAYOUT GUIDE



ARROWS TO BE PLACED IN 3"X3" DOTTED BOX, CENTERED HORIZONTALLY AND VERTICALLY (DOTTED BOX IS A GUIDE AND NOT TO BE PRINTED)

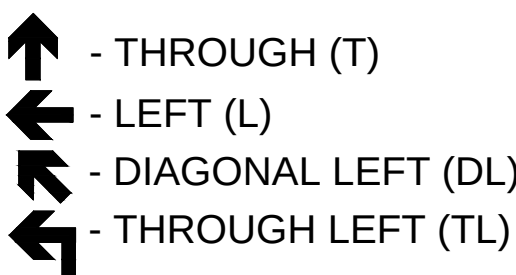
ARROW OPTIONS

PLACED TO THE RIGHT OF TEXT/SYMBOL

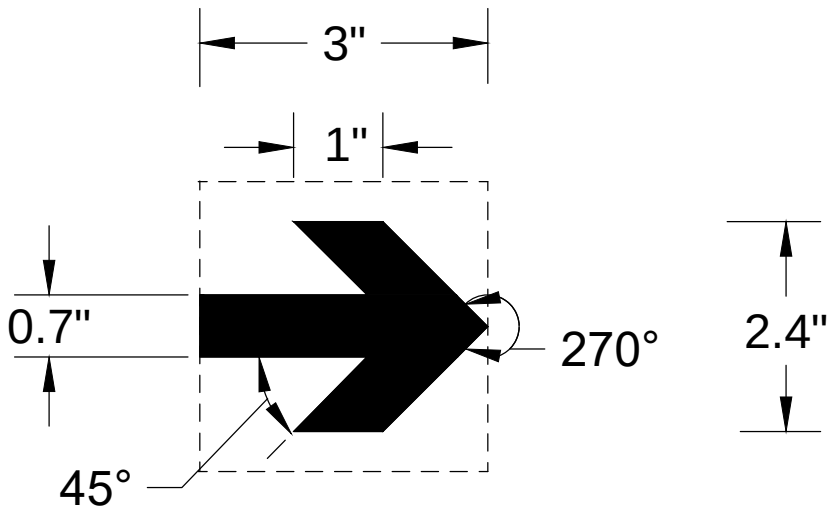


ARROW OPTIONS

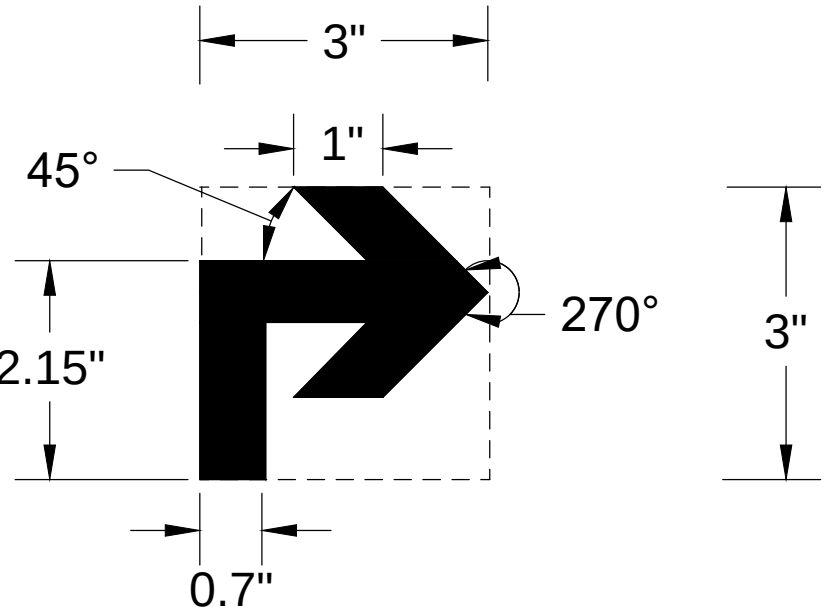
PLACED TO THE LEFT OF TEXT



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 -

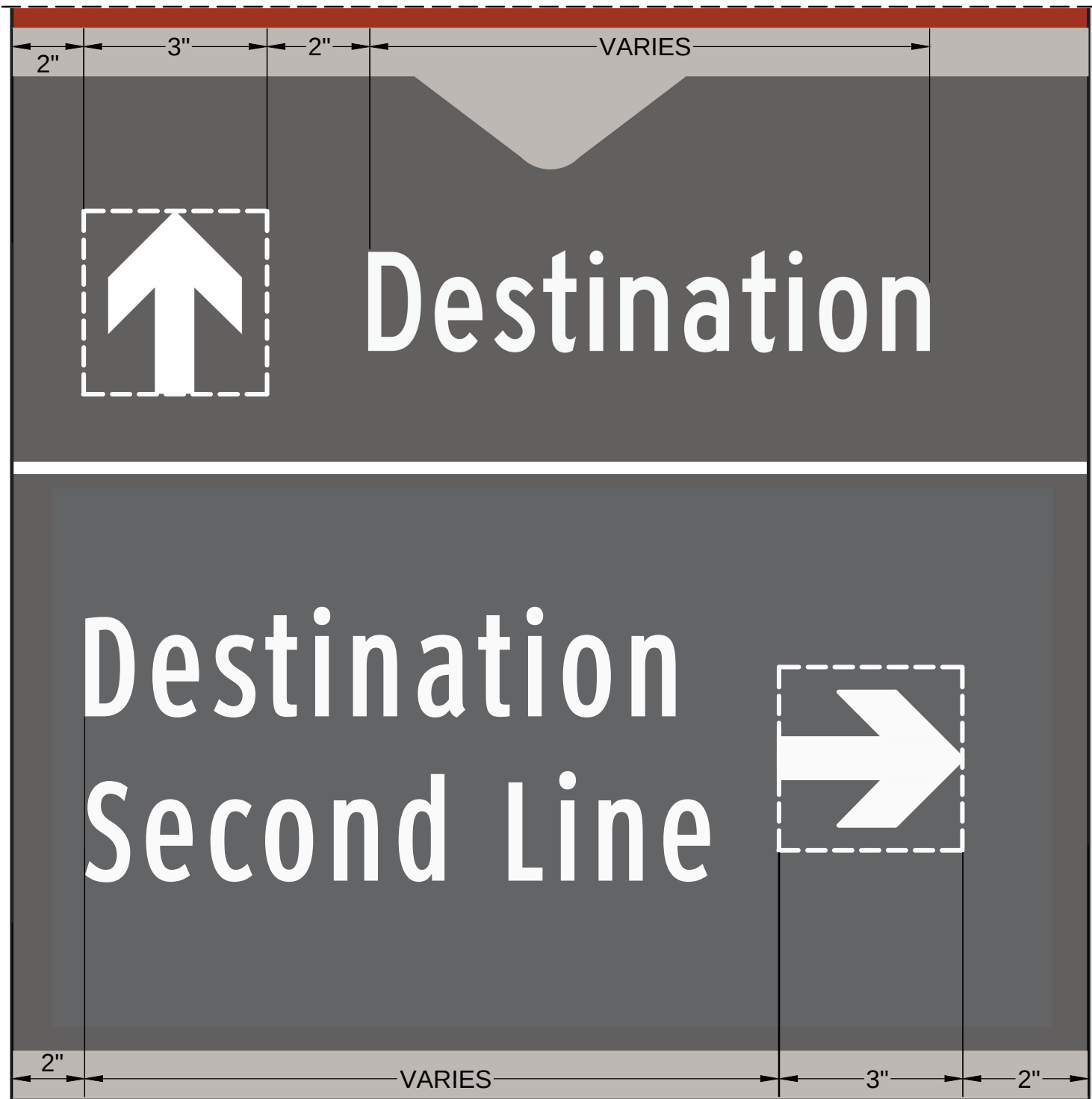
SHEET NAME
BICYCLE WAYFINDING
DETAILS

DRAWING NUMBER
B-2

SHEET NUMBER
3 OF 10

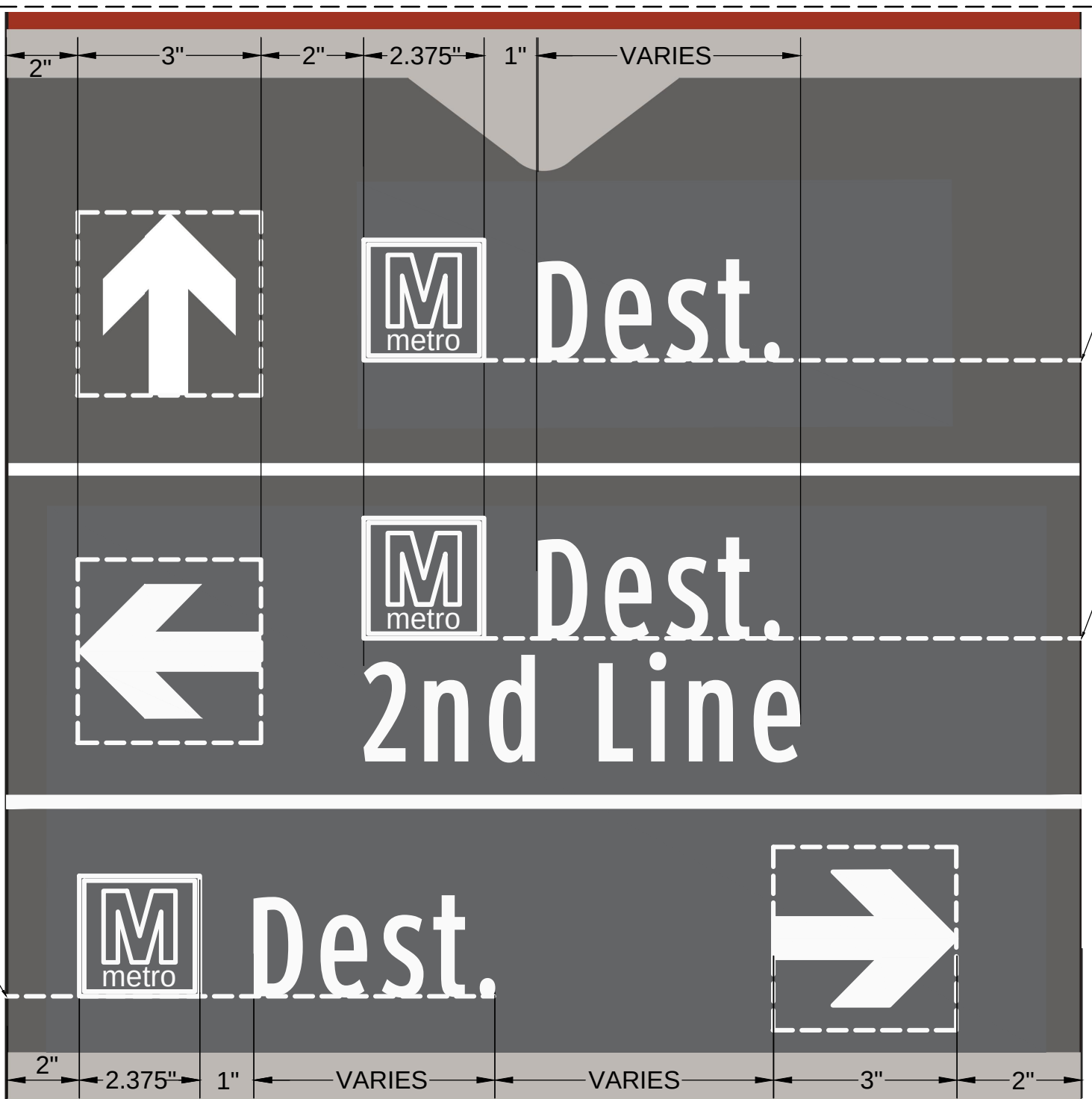
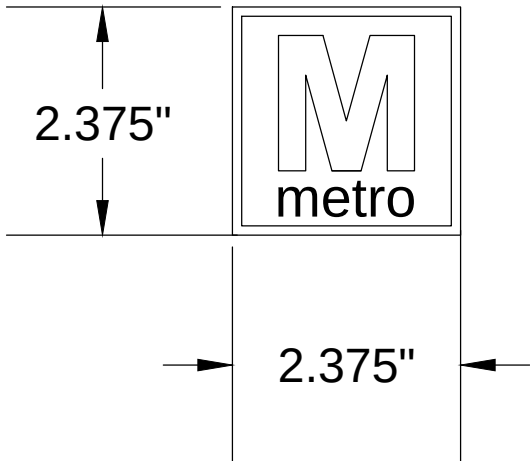
TooleDesignGroup

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PHONE: (301) 927-1900 FAX: (301) 927-2800
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DETAIL 3: BICYCLE WAYFINDING "DESTINATION" SIGN TYPE
HORIZONTAL LAYOUT ALIGNMENT
N.T.S.

METRO SYMBOL

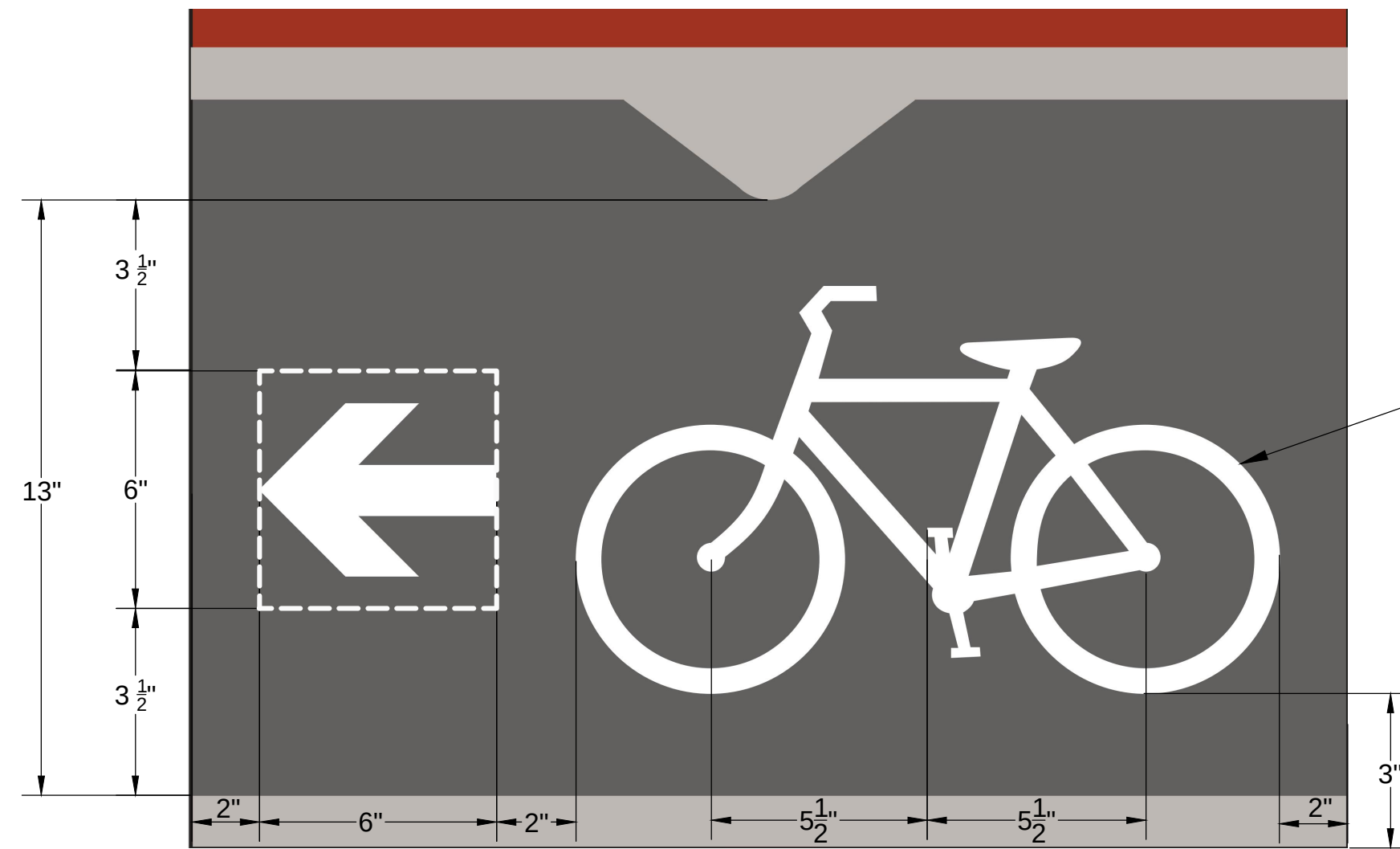
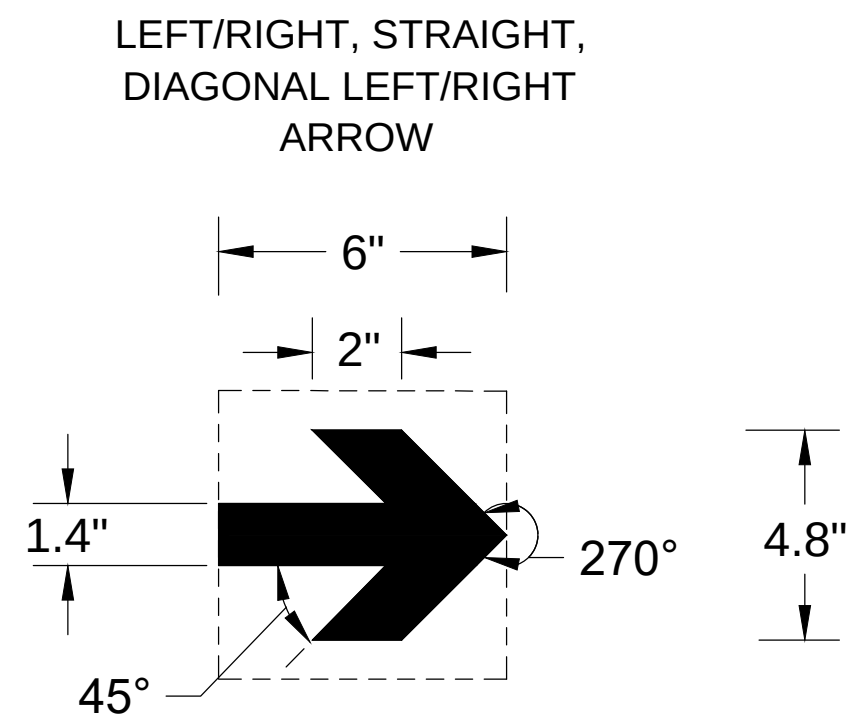


DETAIL 4: BICYCLE WAYFINDING "DESTINATION" SIGN TYPE
FOR DESTINATIONS WITH A METRO SYMBOL
HORIZONTAL LAYOUT ALIGNMENT
N.T.S.



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.

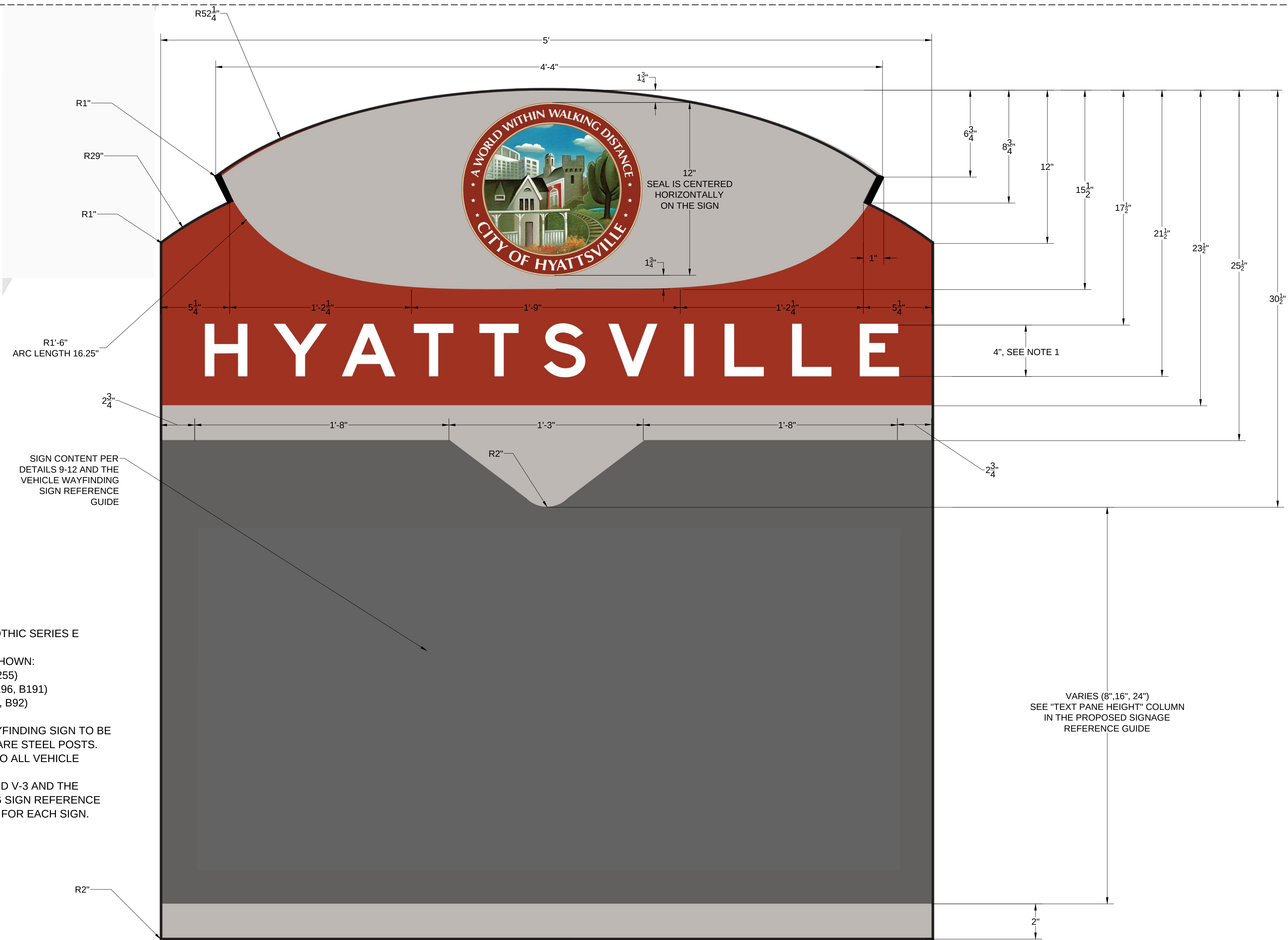


STANDARD MUTCD BICYCLE SYMBOL.
SEE 2004 STANDARD HIGHWAY SIGNS GUIDE,
APPENDIX, SHEET 6-7

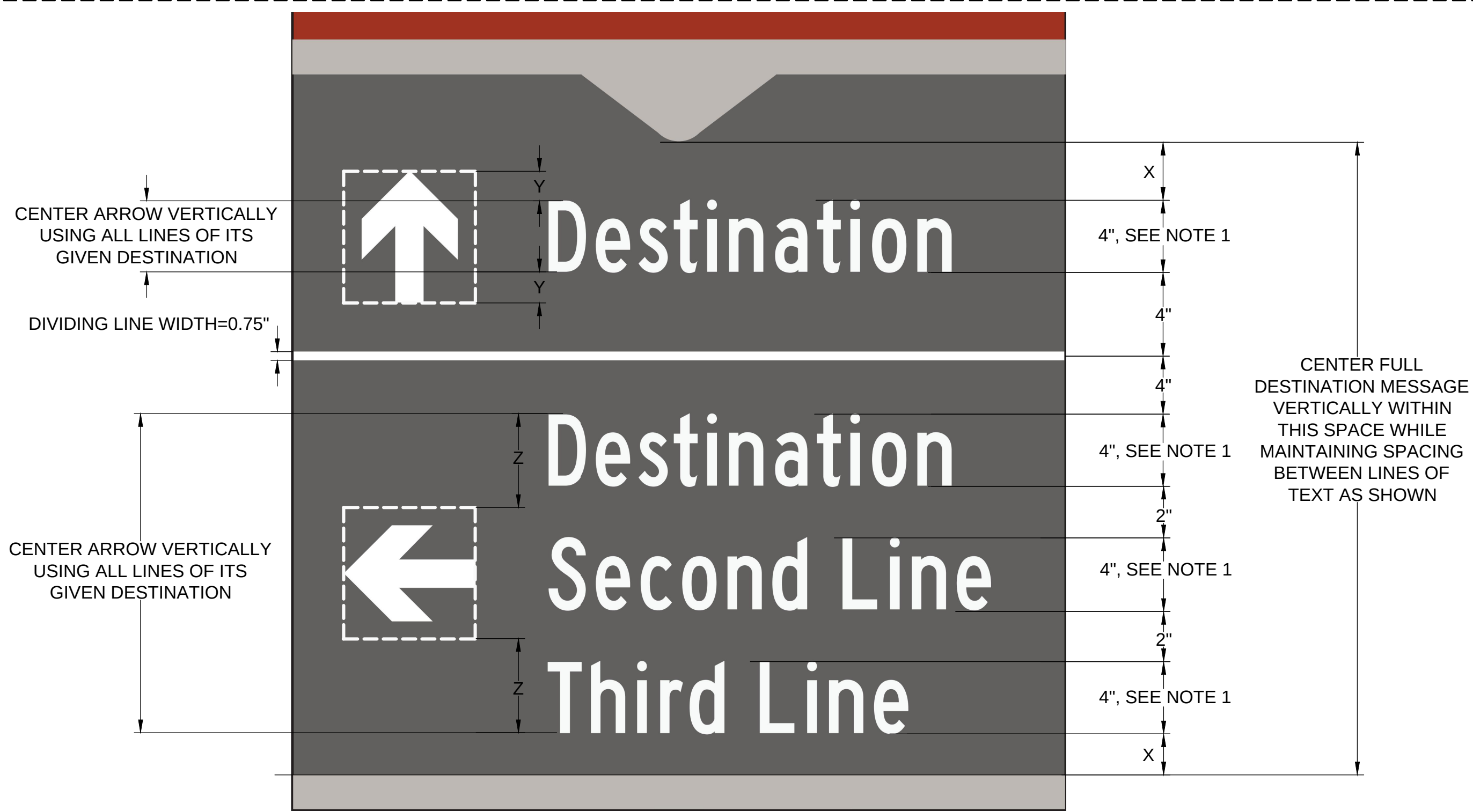
DETAIL 6: BICYCLE WAYFINDING "BIKE ROUTE" SIGN TYPE
HORIZONTAL AND VERTICAL LAYOUT ALIGNMENTS

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.

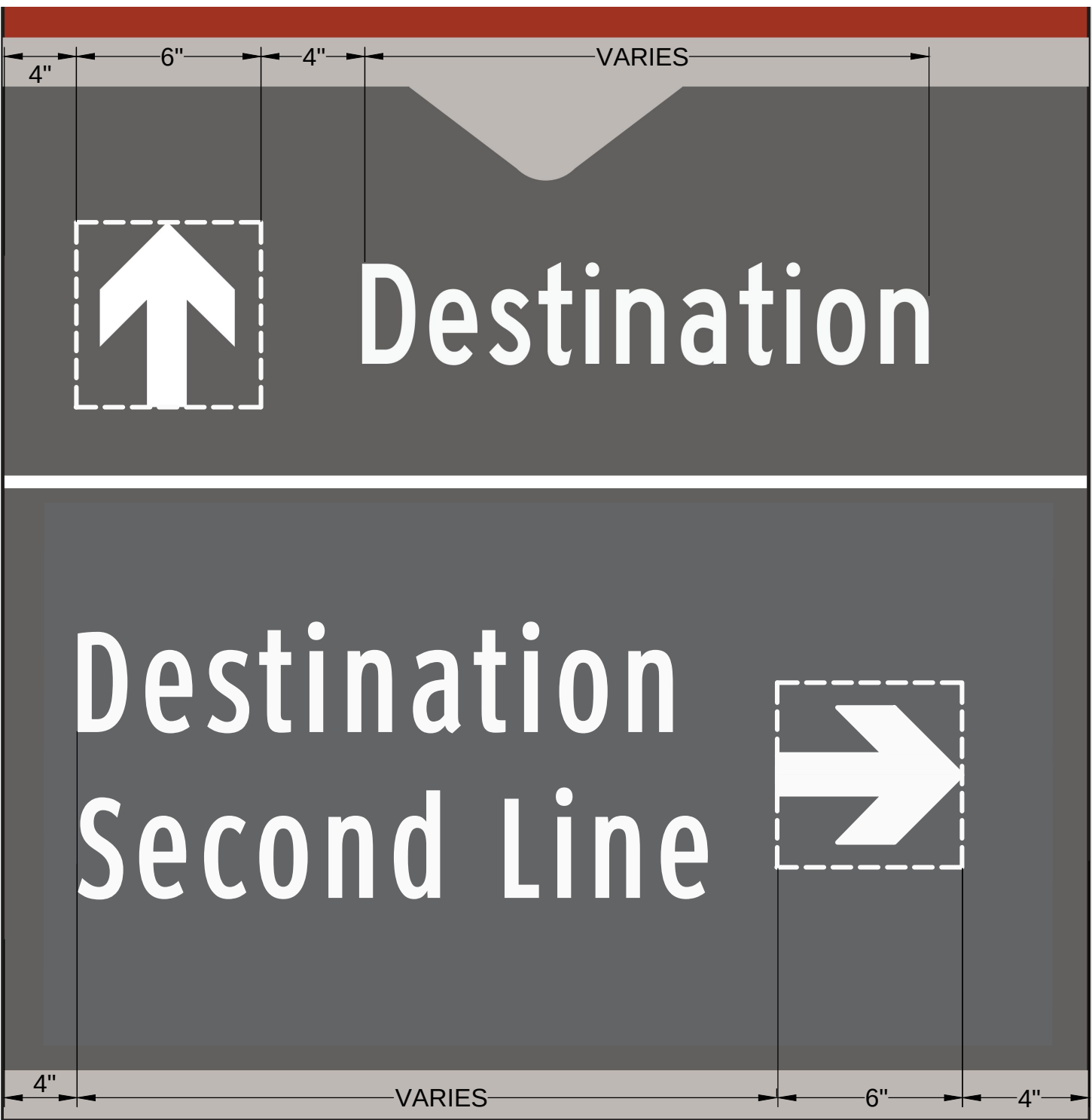


DETAIL 7: VEHICLE WAYFINDING SIGN EXTERIOR LAYOUT
N.T.S.



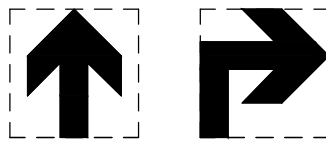
DETAIL 8: VEHICLE WAYFINDING SIGN
VERTICAL LAYOUT ALIGNMENT
N.T.S.

- 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)

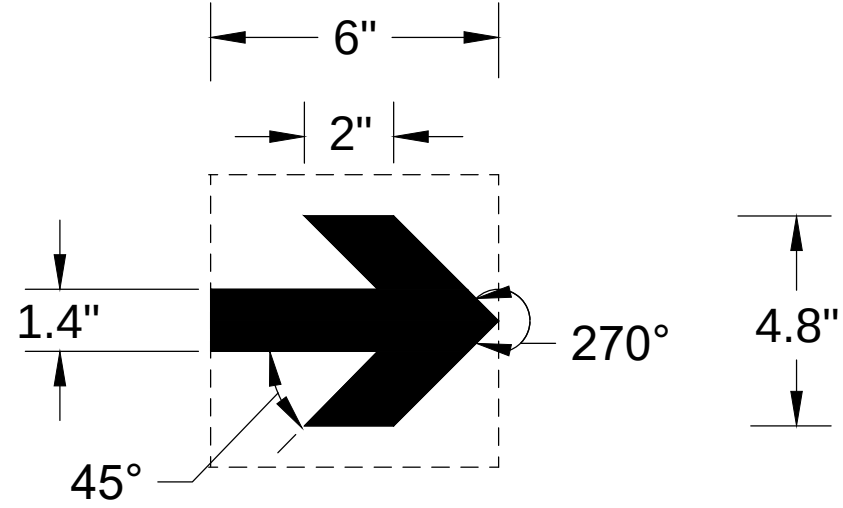
ARROW OPTIONS
PLACED TO THE RIGHT OF TEXT/SYMBOL

- ➔ - RIGHT (R)
- - DIAGONAL RIGHT (DR)
- ➞ - THROUGH RIGHT (TR)

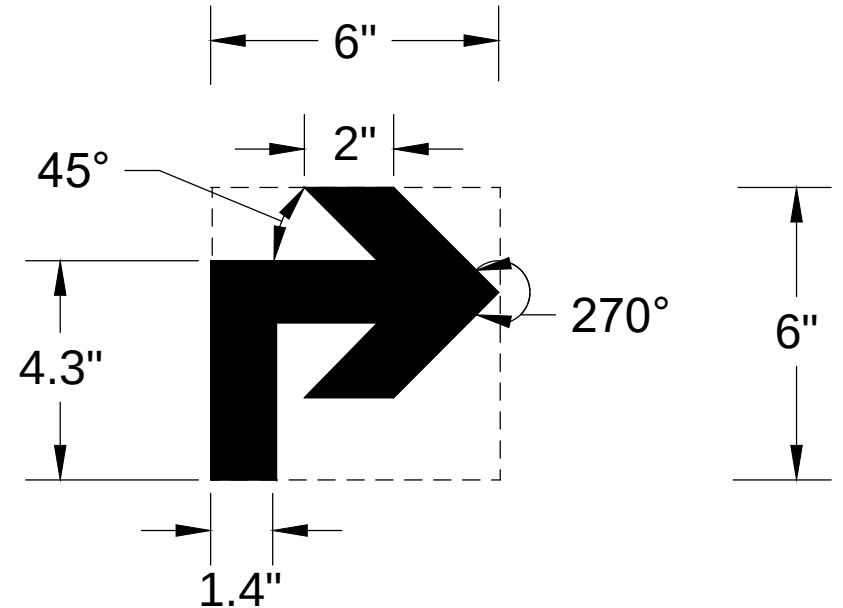
ARROW OPTIONS
PLACED TO THE LEFT OF TEXT

- ➞ - THROUGH (T)
- - LEFT (L)
- - DIAGONAL LEFT (DL)
- - THROUGH LEFT (TL)

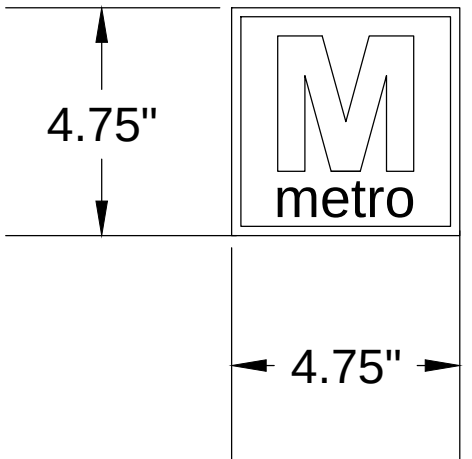
LEFT/RIGHT, STRAIGHT,
DIAGONAL LEFT/RIGHT
ARROW



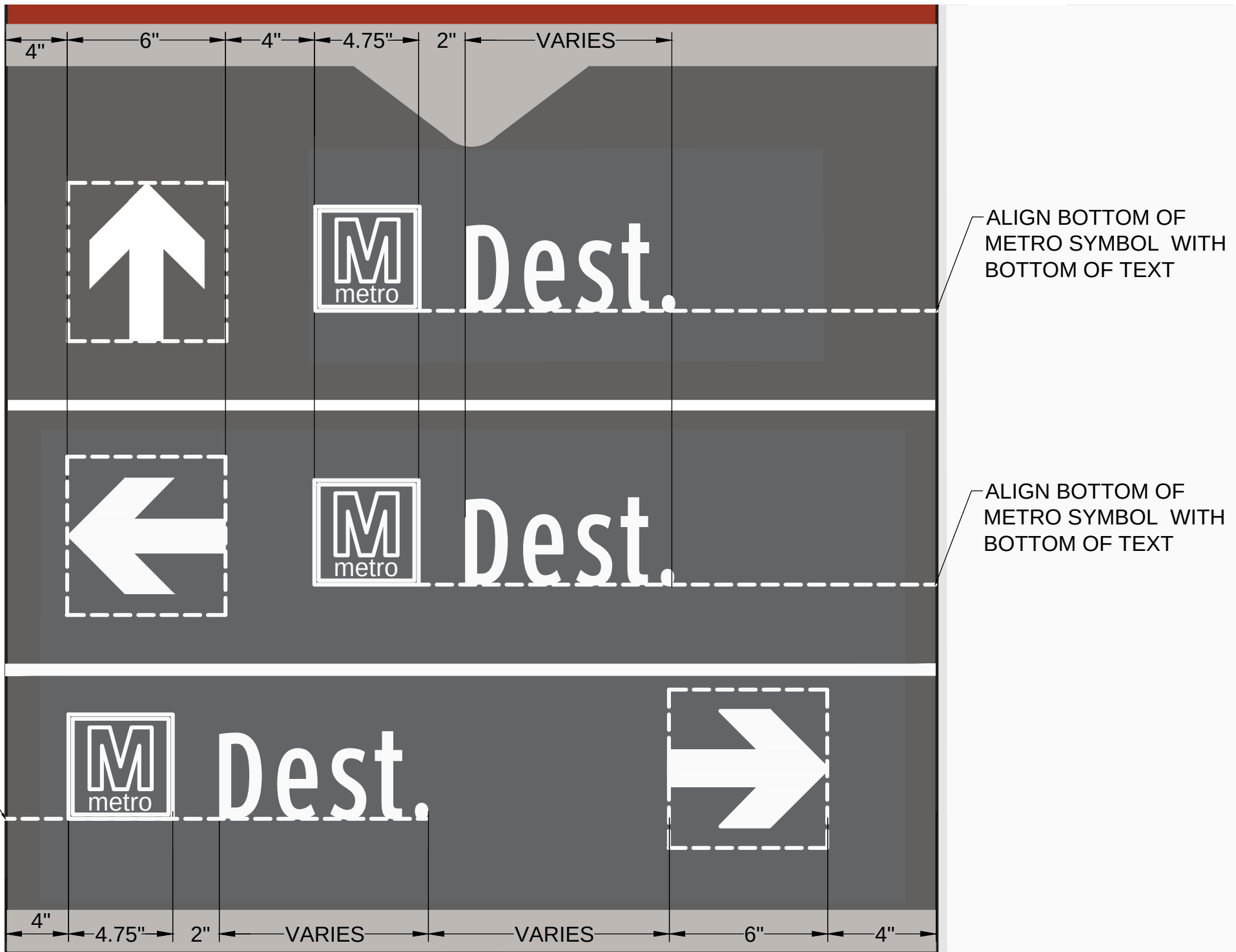
THROUGH LEFT/THROUGH RIGHT ARROW



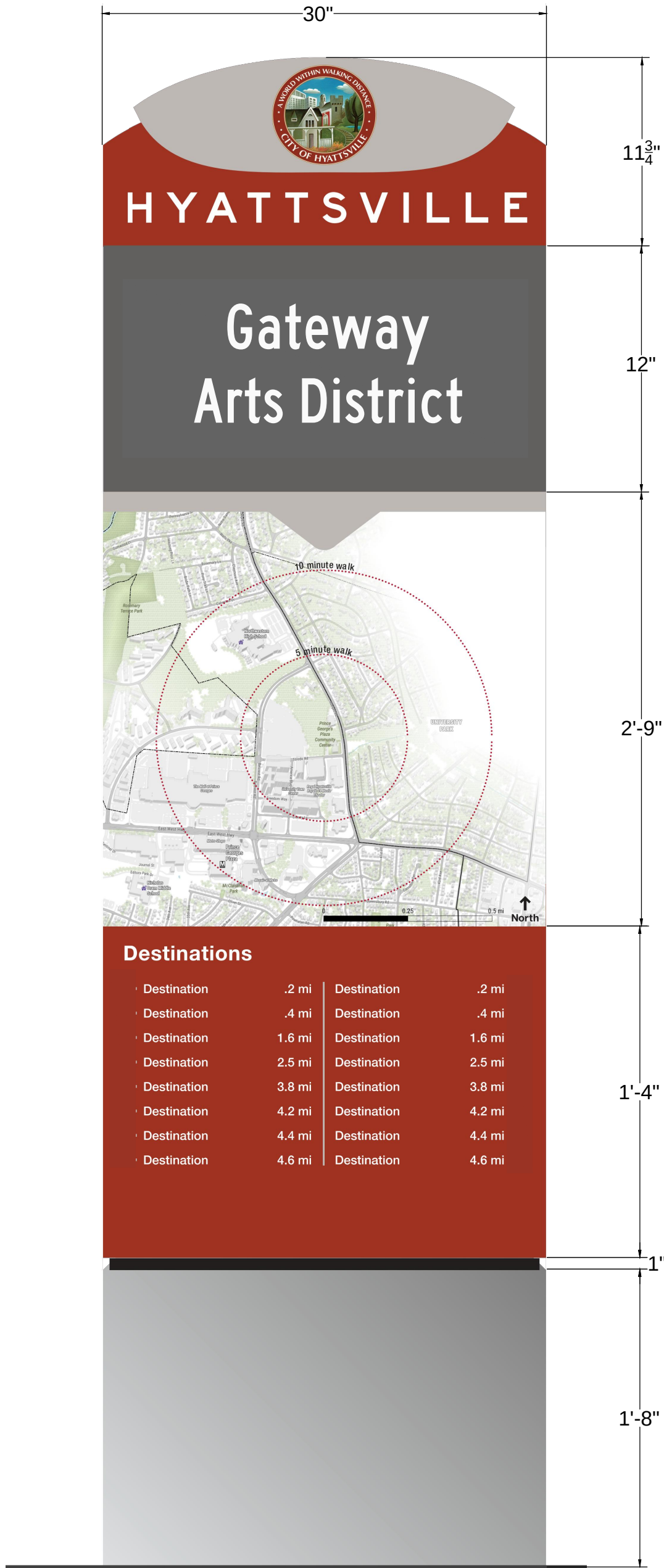
METRO SYMBOL



ALIGN BOTTOM OF
METRO SYMBOL WITH
BOTTOM OF TEXT

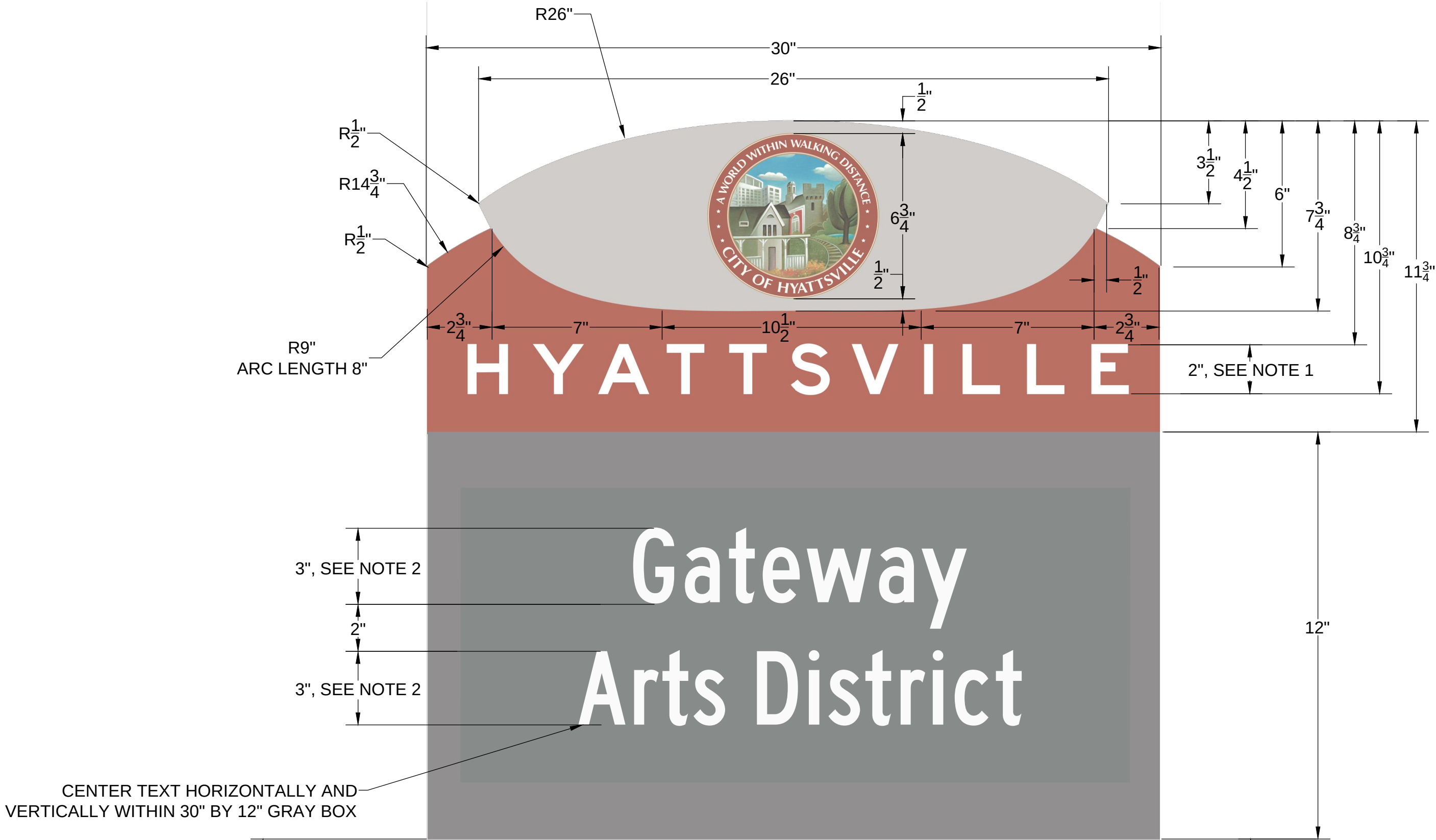


DETAIL 10: VEHICLE WAYFINDING SIGN
WHEN A METRO SYMBOL IS INCLUDED
HORIZONTAL LAYOUT ALIGNMENT
N.T.S.

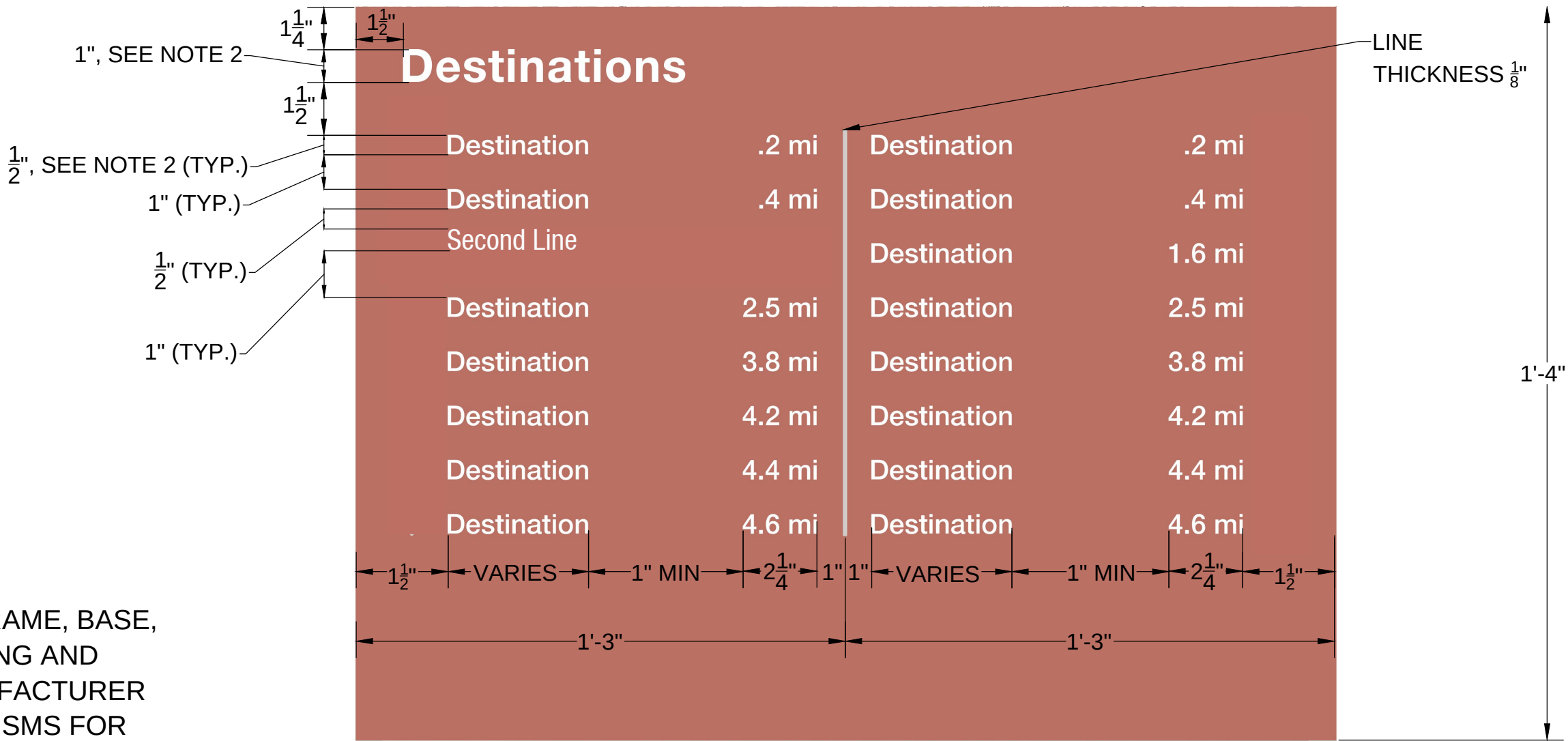


DETAIL 12: PEDESTRIAN KIOSK SIGN
FULL LENGTH LAYOUT
N.T.S.

- 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.



10 OF 10



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.



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.

Hyattsville Wayfinding Cost Estimate 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
Subtotal				\$23,582

Lump Sum Items	\$2,358.24
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Maintenance of Traffic (5%)

Mobilization (5%)

Subtotal	\$25,940.64
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35% Contingency \$9,079.22

40% Project Soft Costs \$10,376.26

Estimated Total Cost	\$45,400.00
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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
Subtotal				\$1,320

Lump Sum Items	\$462.00
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$1,782.00
35% Contingency	\$623.70
40% Project Soft Costs	\$712.80

Estimated Total Cost	\$3,100.00
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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
Subtotal				\$8,846

Lump Sum Items	\$3,096.10
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$11,942.10
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35% Contingency	\$4,179.74
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40% Project Soft Costs	\$4,776.84
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Estimated Total Cost	\$20,900.00
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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
Subtotal				\$123,632

Lump Sum Items	\$12,363.24
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Maintenance of Traffic (5%)

Mobilization (5%)

Subtotal	\$135,995.64
35% Contingency	\$47,598.47
40% Project Soft Costs	\$54,398.26

Estimated Total Cost	\$238,000.00
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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
Subtotal				\$2,222

Lump Sum Items	\$222.24
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Maintenance of Traffic (5%)

Mobilization (5%)

Subtotal	\$2,444.64
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35% Contingency \$855.62

40% Project Soft Costs \$977.86

Estimated Total Cost	\$4,300.00
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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
Subtotal				\$700,000

Lump Sum Items	\$280,000.00
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (10%)

Utility Adjustments (10%)

Subtotal	\$980,000.00
35% Contingency	\$343,000.00
40% Project Soft Costs	\$392,000.00

Estimated Total Cost	\$1,715,000.00
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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 constuction 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
Subtotal				\$200,000

Lump Sum Items	\$40,000.00
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Maintenance of Traffic (5%)

Mobilization (10%)

Utility Adjustments (5%)

Subtotal	\$240,000.00
35% Contingency	\$84,000.00
40% Project Soft Costs	\$96,000.00

Estimated Total Cost	\$420,000.00
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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
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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
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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
Subtotal				\$81,527

Lump Sum Items	\$28,534.55
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$110,061.84
35% Contingency	\$38,521.64
40% Project Soft Costs	\$44,024.74

Estimated Total Cost	\$192,600.00
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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
Subtotal				\$729,800

Lump Sum Items	\$255,430.00
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$989,800.00
35% Contingency	\$346,430.00
40% Project Soft Costs	\$395,920.00

Estimated Total Cost	\$1,732,100.00
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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
Subtotal				\$877,109

Lump Sum Items	\$306,988.11
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$1,187,108.89
35% Contingency	\$415,488.11
40% Project Soft Costs	\$474,843.55

Estimated Total Cost	\$2,077,400.00
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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
Subtotal				\$16,990

Lump Sum Items	\$5,946.50
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$22,936.50
35% Contingency	\$8,027.78
40% Project Soft Costs	\$9,174.60

Estimated Total Cost	\$40,100.00
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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
Subtotal				\$3,660

Lump Sum Items	\$183.00
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Mobilization (5%)

Subtotal	\$3,843.00
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35% Contingency \$1,345.05

40% Project Soft Costs \$1,537.20

Estimated Total Cost	\$6,700.00
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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
Subtotal				\$540,460

Lump Sum Items	\$189,161
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$729,621
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35% Contingency \$255,367

40% Project Soft Costs \$291,848

Estimated Total Cost	\$1,276,800
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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
Subtotal				\$84,480

Lump Sum Items	\$29,568.00
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$114,480.00
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35% Contingency \$40,068.00

40% Project Soft Costs \$45,792.00

Estimated Total Cost	\$200,300.00
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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
Subtotal				\$76,678

Lump Sum Items	\$26,837.30
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$106,678.00
35% Contingency	\$37,337.30
40% Project Soft Costs	\$42,671.20

Estimated Total Cost	\$186,700.00
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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
Subtotal				\$150,000

Lump Sum Items	\$52,500.00
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$210,000.00
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35% Contingency	\$73,500.00
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40% Project Soft Costs	\$84,000.00
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Estimated Total Cost	\$367,500.00
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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
Subtotal				\$11,347

Lump Sum Items	\$4,538.80
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (10%)

Utility Adjustments (10%)

Subtotal	\$15,885.80
35% Contingency	\$5,560.03
40% Project Soft Costs	\$6,354.32

Estimated Total Cost	\$27,800.00
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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
Subtotal				\$57,474

Lump Sum Items	\$22,989.60
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (10%)

Utility Adjustments (10%)

Subtotal	\$80,463.60
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35% Contingency \$28,162.26

40% Project Soft Costs \$32,185.44

Estimated Total Cost	\$140,800.00
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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
Subtotal				\$150,000

Lump Sum Items	\$52,500.00
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Drainage/Erosion & Sediment Control (10%)

Landscaping (5%)

Maintenance of Traffic (5%)

Mobilization (5%)

Utility Adjustments (10%)

Subtotal	\$210,000.00
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35% Contingency	\$73,500.00
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40% Project Soft Costs	\$84,000.00
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Estimated Total Cost	\$367,500.00
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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
Subtotal				\$72,100

Lump Sum Items	\$3,605.00
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Mobilization (5%)

Subtotal	\$75,705.00
35% Contingency	\$26,496.75
20% Project Soft Costs	\$15,141.00

Estimated Total Cost	\$117,342.75
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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

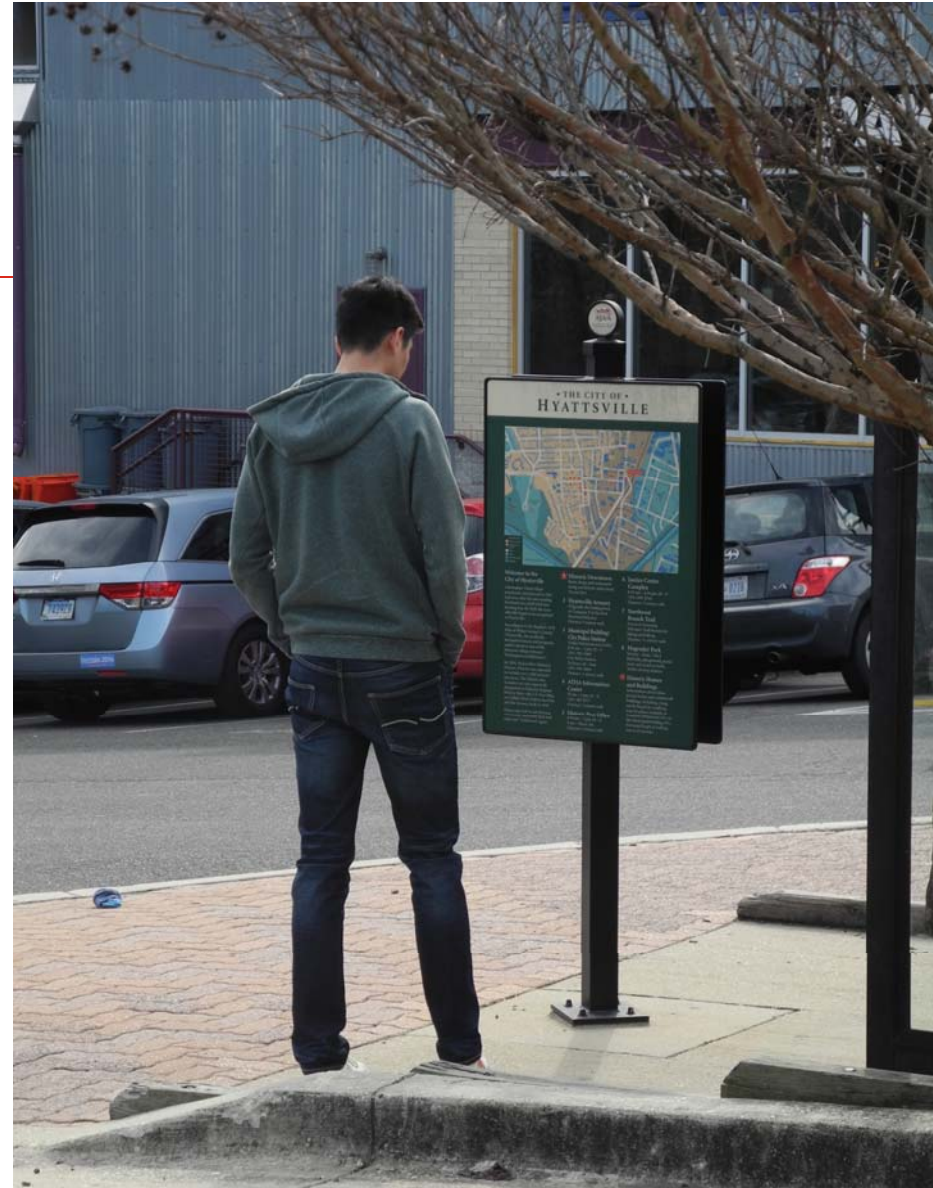
- Project Goals
- Future Needs
- Vision
- Planning Process
- Project Scoring



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

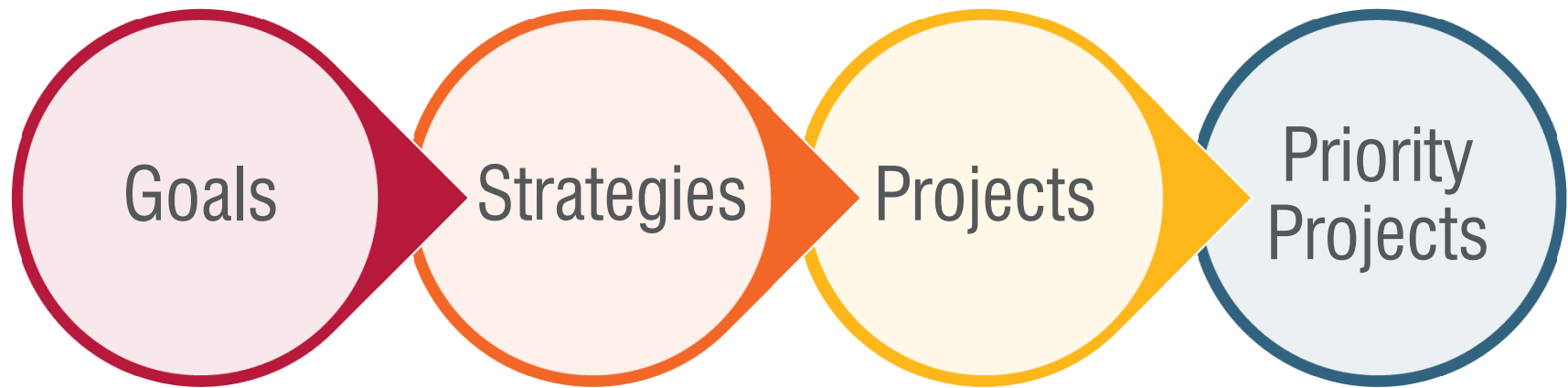


Vision

- 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



Goals

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

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

- T'OOLE**
DESIGN



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 (Points assigned if project meets the prior three goals)	2

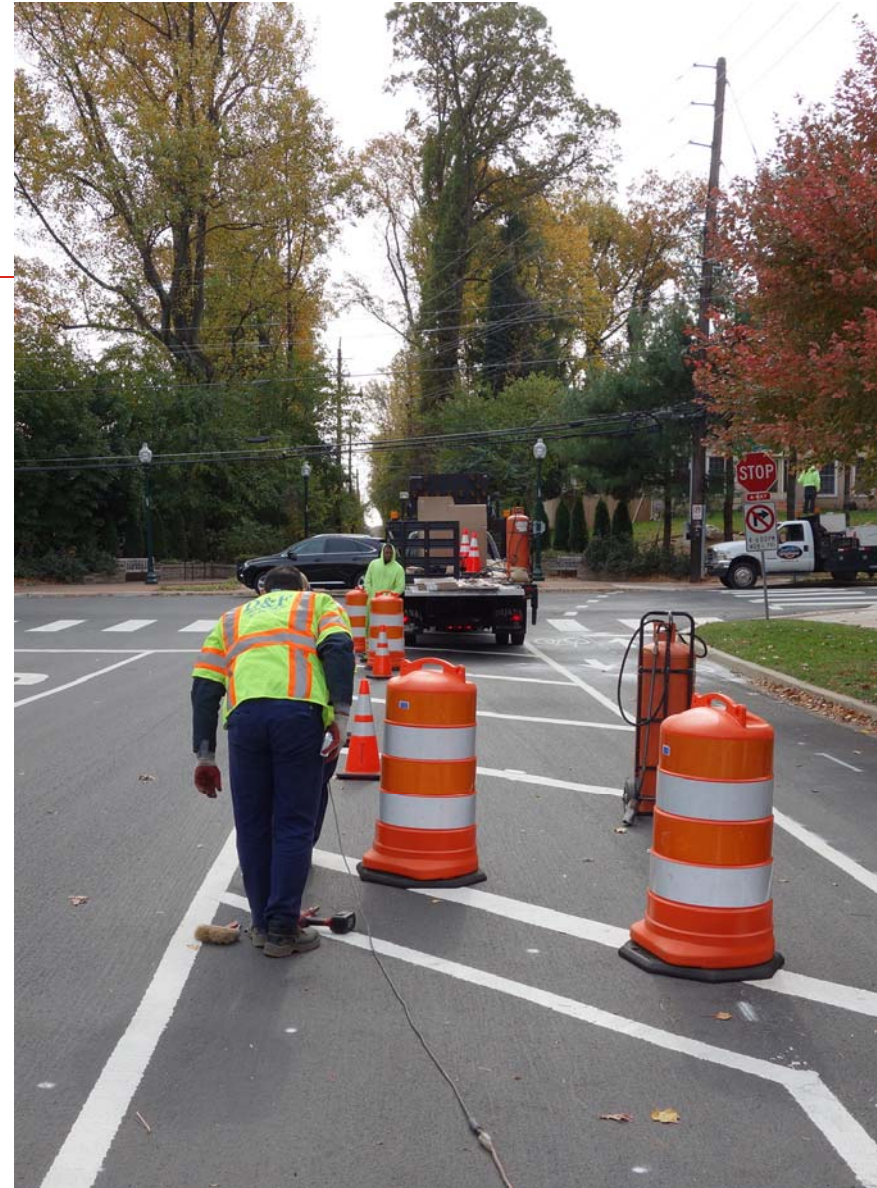
Sequential Action Plan

- 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



T'OOLE
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 42nd 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 42nd 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 38th 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. 38th Street to Manorwood Drive connection will provide vital secondary connection for residents of Hyattsville. A future connection of 38th 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 41st 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 41st 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 41st 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: December 3, 2018

Submitted by: Nicola Konigkramer

Submitting Department: City Clerk

Item Type: Community Notices

Agenda Section: Community Notices and Meetings

SUBJECT

City Calendar: December 4 - December 17, 2018

HCC-162-FY19

Recommendation:

Sponsor(s):

At the Request of the City Administrator

Co-Sponsor(s):

ATTACHMENTS

[Main City Calendar_Dec 4 - Dec 17 2018.docx](#)

Summary Background:

N/A

Next Steps:

N/A

Fiscal Impact:

None

City Administrator Comments:

N/A

Community Engagement:

N/A

Strategic Goals:

Goal 1 – Ensure Transparent and Accessible Governance

Legal Review Required?

N/A

Main City Calendar: December 4 – December 17, 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: December 4 – December 17, 2018

Board of Supervisors of Elections Meeting

December 4, 4:00 PM @ City Building, 3rd Floor Mayor's Office

Police and Public Safety Citizen's Advisory Committee

December 5, 7:30 PM @ City Building

Holiday Tree Lighting

December 7, 7:00 PM @ Magruder Park

Breakfast and Lunch with Santa

December 8, 9:00 AM @ Magruder Park

To reserve your seats, please complete and submit the online reservation form at www.hyattsville.org/santa.

Clause Applause Award Nominations Close

December 10, 5:00 PM

Council Budget Work Session: FY20 Council Budget Priorities

December 10, 8:00 PM – 10:00 PM @ City Building, 3rd Floor Council Chambers

Hyattsville Environment Committee Meeting

December 11, 7:00 PM – 8:30 PM @ City Building, 2nd Floor Prangley Room

Clause Applause Award Judging

December 12, All Day

Public Hearing: Traffic Calming – Maryhurst Drive

December 17, 7:30 PM – 8:00 PM @ City Building, 3rd Floor Council Chambers

Council Meeting

December 17, 8:00 PM – 10:00 PM @ City Building, 3rd Floor Council Chambers