



City of Rockville  
Rockville, Maryland

**REQUEST FOR PROPOSAL #27-25**

**FLEET STREET AND MONROE COMPLETE STREETS PROJECT  
MOA88B21**

**Proposals Due by 2:00 P.M. EST on Friday, December 05, 2025**

ISSUED BY:  
TJ Ellison, CPPB  
Procurement Department  
City of Rockville, City Hall  
111 Maryland Avenue  
Rockville, Maryland 20850  
Phone: (240) 314-8436  
Fax: (240) 314-8439

ISSUED ON:  
October 24, 2025

**A DBE goal of 0% has been assigned for this project.**

Any individual with a disability who would like to receive the information in this publication in another form may contact the  
ADA Coordinator at 240-314-8100, TDD 240-314-8137

**MFD-V Outreach Program**

**It is the intent of the City of Rockville to increase opportunities for minority, female, disabled, or veteran (MFD-V) owned businesses to compete effectively at supplying goods, equipment, and services to the City, within the constraints of statutory purchasing requirements, departmental needs, availability, and sound economical considerations, including subcontracting or mentoring opportunities. Suggested changes and MFD-V enhancements to this solicitation's requirements for possible consideration and/or inclusion in future solicitations are strongly encouraged. Any questions regarding MFD-V outreach or questions/concerns regarding the City's bidding process should be addressed to [procurement@rockvillemd.gov](mailto:procurement@rockvillemd.gov) or 240-314-8430.**



**CITY OF ROCKVILLE  
ROCKVILLE, MARYLAND**

**REQUEST FOR PROPOSAL #27-25  
Fleet Street and Monroe Complete Streets Project  
MOA88B21**

**RECEIPT AND HANDLING OF PROPOSALS**

Sealed proposals will be received electronically via a City designated bid/proposal receipt software solution until **2:00 P.M. EST, December 05, 2025**. The offeror assumes full responsibility for the timely delivery of a proposal via the designated solution. Proposals delivered in any other fashion will not be considered. Properly submitted proposals will be opened in a virtual environment after the time set for receipt of proposals.

Submission of a proposal electronically is consent by the offeror to conduct any or all elements of the procurement by electronic means, in accordance with the terms of this request for proposals.

**The RFP documents will be made public via the City's Collaboration Portal and eMarylandMarketplaceAdvantage, however, proposals will only be accepted electronically via the City's Collaboration Portal.**

Proposals presented after the proposal receiving deadline will not be accepted for any reason. The official time clock for receiving proposals will be that of the City's third-party software solution providers located at Rockville City Hall.

**ATTENTION: OFFERORS ARE HEREBY NOTIFIED THAT THE CITY'S THIRD-PARTY SOFTWARE SOLUTION PROVIDER'S COMPUTER SERVER TIME MAY DIFFER FROM THAT OF OTHER ELECTRONIC DEVICES, COMPUTER SOFTWARE AND COMPUTER HARDWARE THAT MAY BE USED TO ELECTRONICALLY SUBMIT THE PROPOSAL. OFFERORS ARE RESPONSIBLE FOR ALLOWING ADEQUATE TIME TO SUCCESSFULLY DELIVER THE PROPOSAL TO THE REQUIRED ELECTRONIC LOCATION BY THE REQUIRED TIME.**

In accordance with Chapter 17 of the City's Procurement Ordinance, competitive sealed proposals are not publicly opened or otherwise handled so as to permit disclosure of the identity of any offeror or the contents of any proposal to competing offerors during the evaluation process. The proposals, except for information identified by the offeror as proprietary, shall be open for public inspection after the contract award.

**Proposals must be submitted electronically. Proposals will not be opened publicly.**

If a Joint Venture (JV) responds to this RFP, City of Rockville will not accept separate Proposals from the JV constituents. A firm will not be permitted to submit on more than one (1) JV for this RFP. Also, a firm that responds to this RFP as a prime or a prime JV constituent may not be included as a designated subcontractor to another firm that responds as a prime to this RFP. Multiple responses under any of the foregoing situations may cause the rejection of all responses of the firms involved. The above does not preclude a firm that has not submitted as a prime from being set forth as a designated subcontractor to more than one (1) prime responding to this RFP.

All proposals received for this contract will be reviewed on a competitive basis. The Firm that submits the highest rated Technical Proposal will be requested to submit a Price Proposal. Salary, Payroll Burden, and Overhead limitations have been eliminated. Salaries shall be actual per-hour salary rates as supported by Certified Payroll Rosters while Prime and Subconsultants' Payroll Burden and Overhead rates shall be supported by either a Maryland Department of Transportation Modes approval letter or by an annual overhead audit performed by an independent Certified Public Accountant in accordance with Federal Acquisition Regulations 48 Code of Federal Regulation 1, Part 31 and applicable MDOT guidelines. The annual overhead audit shall identify separate rates for

both home office overhead and field overhead. If negotiations with the Firm is timely and successful, a contract may be awarded to the Firm.

The City of Rockville shall comply with procurement requirements established in State and local laws, regulations, policies and procedures that are not addressed by or are not in conflict with applicable Federal regulations, as specified in 2CFR Part 1201. When state and local procurement laws, regulations, policies, or procedures are in conflict with applicable Federal laws and regulations, a contracting agency shall comply with Federal requirements to be eligible for Federal-Aid reimbursement, as specified in 2CFR200.102.

Each Offeror is requested to indicate its eMMA vendor number in the Transmittal Letter (cover letter) submitted at the time of its Proposal submission to this RFP.

Before a business entity can do business in the State of Maryland, it must be registered with the State Department of Assessments and Taxation (SDAT). SDAT is located at State Office Building, Room 803, 301 West Preston Street, Baltimore, Maryland 21201. The SDAT website is <http://sdattax.com/RealProperty/Pages/default.aspx>. It is strongly recommended that any potential Offeror complete registration prior to the due date for receipt of Proposals. An Offeror's failure to complete registration with SDAT may disqualify an otherwise successful Offeror from final consideration and recommendation for contract award.

Technical Proposals must be submitted in the format outlined within the SHA Standard Request for Proposals guidelines. The SHA Standard Request for Proposals guidelines can be found on the SHA Web Page at <https://roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=767> by navigating to the Standard Request for Proposals link.

The SHA, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C §§ 2000d to 2000d-4) and the Regulations, hereby notifies all offerors that it will affirmatively ensure that any contract entered into pursuant to this RFP, Disadvantaged Business Enterprises (DBE) will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin, in consideration for an award.

Consultants interested in submitting a Technical Proposal must comply with the SPECIAL PROVISIONS, AFFIRMATIVE ACTION REQUIREMENTS, UTILIZATION OF DISADVANTAGED BUSINESSES, THE SURFACE TRANSPORTATION AND UNIFORM RELOCATION ASSISTANCE ACT OF 1987, ISTEA OF 1991, MAP 21 OF 2012, FAST ACT 2015, AND INFRASTRUCTURE INVESTMENT AND JOBS ACT OF 2021 located at <https://roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=767> and selecting Standard Request for Proposals link).

City of Rockville hereby notifies all bidders/offerors that regarding any contract entered into pursuant to this RFP, the contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

It is the goal of MDOT that disadvantaged business enterprises (DBE) participate in all federal-aid contracts. Each contract will be evaluated for the placement of a goal for DBE participation on a contract-by-contract basis. MDOT certified DBE firms are encouraged to respond to this solicitation. The MDOT MBE website is <https://www.mdot.maryland.gov/tso/pages/index.aspx?pageid=91>.

Technical Proposals received after the deadline time will not be accepted, no matter how transmitted, and will be returned unopened to the Consultant.

SHA reserves the right to reject any and all Proposals received in response to this request and is not liable for any cost incurred by any Firm in connection with the preparation and presentation of Proposals.

### **REQUEST FOR PROPOSALS (RFP) DOCUMENTS**

The RFP documents are available via the City's Collaboration Portal and via eMarylandMarketplaceAdvantage under BPM053811:

[Contract Insight - Collaboration Portal \(rockvillemd.gov\)](https://rockvillemd.gov/collaboration-portal)

<https://emma.maryland.gov/>

### **PRE-PROPOSAL MEETING AND WALK-THROUGH**

A virtual, telepresence pre-proposal meeting will be held on **TUESDAY, NOVEMBER 04, 2025, AT 02:00 PM (EDT)**. Offerors must register below in order to attend the meeting. This meeting is not mandatory; however, offerors are strongly encouraged to attend. Individuals interested in viewing the vicinity of the work are encouraged to do so independently, and in a socially distanced manner, prior to the pre-proposal meeting. Offerors shall assume complete responsibility and liability for any and all visits.

**Register for Virtual Pre-Proposal Meeting Here:**     [Register](#)

### **SUBMITTAL OF QUESTIONS**

Technical and contractual questions pertaining to this RFP may be directed to Jonathan Pierson, CPSM, C.P.M., Assistant Director, via the City's Collaboration Portal no later than **WEDNESDAY, NOVEMBER 12, 2025, BY 2:00 P.M. EDT**. Oral answers to questions relative to interpretation of requirements or the proposal process will not be binding on the City.

To ensure fair consideration for all offerors, any interpretation made to prospective offerors will be expressed in the form of an addendum to the requirements, if such information is deemed necessary for the preparation of proposals or if the lack of such information would be detrimental to the uninformed offeror. Such addendums, if issued, will be posted at the City's Collaboration Portal listed below and in the eMarylandMarketplaceAdvantage portal under BPM053811:

[Contract Insight - Collaboration Portal \(rockvillemd.gov\)](https://rockvillemd.gov/collaboration-portal)

<https://emma.maryland.gov/>

Please note, that it is the proposer's responsibility to check this site frequently for Addendums, which may impact pricing, this documents requirements, terms and/or conditions. Failure to sign and return an Addendum with your response may result in disqualification of proposal.

### **PROJECT DESCRIPTION**

The City of Rockville is seeking consultant assistance to perform professional engineering services to design a shared-use path along the southside (eastbound) of Fleet Street between Maryland Avenue and the westernmost entrance to Richard Montgomery High School and along the westside (southbound) of Monroe Street between E. Middle Lane and Fleet Street as part of city's pedestrian and bicycle safety capital improvement program. The project's scope of work includes Planning, Preliminary Design, and Final Design services. SHA may award one project-specific contract for these services. The duration of the contract will not exceed thirteen (13) months. The total funding authority for this contract shall not exceed \$390,945.00. No minimum amount of work or funds is guaranteed under this contract. All work performed under this contract must be for services as outlined in the contract scope of work and in conformance with all contract terms and conditions and payment provisions.

### **AWARD**

Upon receipt of technical proposals, the City of Rockville shall rate and rank the proposals on the basis of the evaluation factors published in the Request for Proposal and select the offeror whose professional qualifications and proposed services are deemed most meritorious. The City will then review the selected offeror's price proposal,



after which, negotiations shall then be conducted, with the offeror. If a contract satisfactory and advantageous to the City can be negotiated at a price considered fair and reasonable, the award shall be made to that offeror. If price negotiations with the offeror ranked first are not successful, negotiations shall be formally terminated and negotiations conducted with the offeror ranked second most meritorious, and so on, until ~~such~~ a contract can be negotiated at a fair and reasonable price.

#### **NOTICE TO OFFERORS/PROPOSERS**

“Pursuant to 7-201 et seq of the Corporations and Associations Article of the Annotated Code of Maryland, corporations not incorporated in the State shall be registered with the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, MD 21201 before doing any interstate or foreign business in this State. Before doing any intrastate business in this State, a foreign corporation shall qualify with the Department of Assessments and Taxation.” Offerors must supply with their bids their US Treasury Department Employer’s Identification Number as such number is shown on their Employer’s Quarterly Federal Tax Return (US Treasury Department Form No. 941). Companies located outside Maryland should call 1-410-767-1006, or e-mail: [charterhelp@dat.state.md.us](mailto:charterhelp@dat.state.md.us).

#### **QUALIFICATIONS TO CONTRACT WITH PUBLIC BODY**

Offerors must be qualified to bid in the state in accordance with Section 14-308 of the State Finance and Procurement Article of the Annotated Code of Maryland which ordains that any person convicted of bribery (upon acts committed after July 1, 1977) in furtherance of obtaining a contract from the State or any subdivision of the State of Maryland shall be disqualified from entering into a contract with the City.

#### **EXPENSES ASSOCIATED WITH RESPONSE**

The City of Rockville will not be responsible for any expenses incurred by a firm in preparing and submitting a proposal. All proposals shall provide a straightforward, concise delineation of the firm’s capabilities to satisfy the requirements of this request. Emphasis should be on completeness and clarity of content.

#### **REJECTION OF PROPOSALS**

The City reserves the right to reject any or all proposals in part or in full and to waive any technicalities or informalities as may best serve the interests of the City.

#### **DISABILITY INFORMATION**

Any individuals with disabilities who would like to receive the information in this document in another form may contact the ADA Coordinator at (240) 314-8100; TDD (240) 314-8137.

#### **W-9 FORM REQUIRED**

Successful respondents are required to complete and submit a W-9 Form. The W-9 form can be accessed at: <http://www.irs.gov/pub/irs-pdf/fw9.pdf?portlet=3>. It is the successful respondent’s responsibility to act upon this instruction for submitting a W-9 form. The City will not be able to process payments if this form is not completed and submitted to the Purchasing Division.

#### **NO CONTACT POLICY**

Unless otherwise stated, any contact with any City official, employee, agent, or other representative concerning this Request for Proposals other the assigned buyer or procurement representative is prohibited. Any such unauthorized contact may disqualify the proposer from this procurement.



**TABLE OF CONTENTS**

**Section 1: Project Overview**

**Section 2: Scope of Work and Technical Requirements**  
A.....09

**Section 3: General Instructions for Proposal Preparation and Delivery**  
A.Proposal Format.....21

**Section 4: Evaluation Criteria**  
A.Proposal Evaluation.....28

**Attachments**

|              |                                                                              |     |
|--------------|------------------------------------------------------------------------------|-----|
| Attachment A | Feasibility Study.....                                                       | 29  |
| Attachment B | City of Rockville Maryland General Conditions And Instructions.....          | 196 |
| Attachment C | Insurance .....                                                              | 205 |
| Attachment D | Certification for Contracts, Grants, Loans, and Cooperative Agreements ..... | 207 |
| Attachment E | References .....                                                             | 208 |
| Attachment F | Affidavit .....                                                              | 209 |
| Attachment G | Questionnaire .....                                                          | 210 |



**CITY OF ROCKVILLE  
ROCKVILLE, MARYLAND**

**REQUEST FOR PROPOSAL #27-25  
FLEET STREET AND MONROE COMPLETE STREETS PROJECT  
MOA88B21**

**SECTION 1**

**PROJECT OVERVIEW**

The City of Rockville is issuing this Request for Proposals (RFP) for the Fleet Street and Monroe Street Shared-use Path design Project. The City of Rockville seeks professional engineering services to design a shared-use path along the southside (eastbound) of Fleet Street between Maryland Avenue and the westernmost entrance to Richard Montgomery High School and along the westside (southbound) of Monroe Street between E. Middle Lane and Fleet Street as part of city's pedestrian and bicycle safety capital improvement program. The Consultant Firms shall be proficient in the services listed in this RFP and shall bring an experienced and expert staff to the contracts as required. Firms interested in being considered must submit a complete Standard Form (SF) 330 concurrent with the technical proposal.

City of Rockville anticipates awarding one project-specific contract for these services. The duration of the Contract will not exceed thirteen (13) months. The total funding authority for this contract shall not exceed \$390,945.00. City of Rockville reserves the right to modify the total funding authority. No minimum amount of work or funds is guaranteed under this Contract. The Contract will be funded with Federal Aid Highway Program (FAHP) grant funds administered by the Federal Highway Administration, with assistance from the Maryland State Highway Administration.

An Offeror, either directly or through its subcontractor(s), must be able to provide all services and meet all the requirements requested in this solicitation and the successful Offeror (the Contractor) shall remain responsible for Contract performance regardless of subcontractor participation in the work. Firms interested in being considered for work on these contracts must submit a Technical Proposal for the contract as set forth herein.

The procurement of engineering and design related services funded by FAHP funds shall be conducted in with competitive negotiation (qualifications-based selection) procedures in accordance with the Brooks Act codified under 40 U.S.C. 1101-1104. The Contract resulting from this solicitation shall be structured as project-specific and payment methods shall include cost plus fixed fee and unit cost rates. Additional information regarding payment methods will be provided to the selected firm in the Request for Price Proposal. To standardize the method of proposal submission, and to facilitate distribution of proposal materials, it shall be necessary that all firms observe the following procedures.

**Consultant Services Required**

The services to be performed under this contract will provide final engineering designs for the shared-use path based on the preferred alternative taken from the previously prepared feasibility study and prepare construction documents to be bid publicly by the City of Rockville.

Through a Metropolitan Washington Council of Governments Transportation Land Use Connections project, a consultant conducted a feasibility study for a complete streets/road diet project to provide bicycle facilities along the project extents. This study included analysis of traffic patterns and increased congestion, conceptual design, and public outreach. Repurposing a motor vehicle travel lane and installing a shared-use path along these sections will provide an enhanced pedestrian connection and a new bicycle connection to multiple Rockville Town Center destinations, including a Metrorail Station, county and city offices, a public high school, multiple older adult

residential communities, a residential community for persons with disabilities, and retail and commercial offices. The completed feasibility study is attached herein (Attachment A).

The consultant prepared two concept alternatives: an on-street separated cycle track and an on-street side path. This study was completed in June 2023. The city deemed the “side path” option as the preferred alternative, with support from the community. Also proposed in this alternative included signal and intersection improvements to the intersections Fleet Street and Monroe Street and Monroe Street and E. Jefferson Street (MD 28), a state owned and maintained intersection.

To accommodate the shared-use path, a motor vehicle travel lane will be repurposed from both Fleet Street and Monroe Street. A new roadway alignment is required as are modifications to the traffic signals and phasing at Fleet and Monroe streets and Monroe and E. Jefferson (MD 28) streets. Signal plans should provide for non-motorized users while minimizing impact to motorists. The intersection of Monroe and E. Jefferson (MD 28) streets should consider a bicycle signal if approved by the Maryland Department of Transportation.

The shared-use path should be designed to be at least ten feet wide. The west terminus of the Fleet Street shared-use path should allow a transition between on-road bicycles to use the trail and separate pedestrians and bicyclists as much as possible at the transition. The east terminus of the Fleet Street shared-use path should seamlessly connect into the existing shared-use path along Fleet Street in front of Richard Montgomery Highschool. The north terminus of the Monroe Street shared-use path should lead pedestrians and bicyclists to the existing E. Middle Lane crossing just west of Monroe Street.

All the plans should be prepared in accordance with the latest standards, specifications, book of standards, and guidelines of the Maryland State Highway Administration and other latest road design guidelines.

The Contractor shall prepare and submit construction plans, cost estimates, and construction specifications for the complete streets/road diet project for Fleet Street and Monroe Street. The documents shall include the removal of a travel lane on each roadway, the installation of a shared-use path on the south side of Fleet Street and on the west side of Monroe Street, and intersection improvements and signal modifications at the intersections of Fleet Street and Monroe Street, and Monroe Street and E. Jefferson Street (MD 28). The construction plans shall include general notes; typical sections; construction details; roadway plans showing the revised curb and gutter, shared use path, landscape buffer, and storm drain; storm drain profiles and structure and pipe schedule; signing and marking plans, vertical profiles, as necessary; streetlight plans, utility relocation plans, maintenance of traffic plans, traffic signal plans, Forest Conservation Plan (FCP), erosion and sediment control plans, storm water management plans, landscape plans, and all other plans necessary to complete the project.

All pedestrian facilities, such as sidewalk ramps, crosswalks, sidewalks, and shared-use paths shall be designed for compliance with the most recent ADA regulations and PROWAG standards.

It is expected that this project will be completed within 13 months from the date of purchase order and would approximately follow the project schedule listed below.

The firm may be authorized to subcontract for specialty services with prior approval of City of Rockville. The firm shall be proficient in the services and shall bring an experienced and expert staff to the project.

Listed below is the Scope of Services and Examples of Work, Certifications and Engineering Standards and Guidelines.

## **SECTION 2**

### **Scope of Work and Technical Requirements**

#### **Scope of Services and Examples of Work:**

The plans shall utilize the recommended concept #1 from the Fleet and Monroe Streets feasibility study, as well as City's standard notes, borders, and details when applicable. The design shall include the shared use path alignment and all associated proposed grading as a result of the shared use path. The plans shall provide details for all restoration to include the repair of driveway aprons, curb and gutter, pavements, and all disturbed areas. All impacts to trees, landscaping, utilities, or any other appurtenances shall be noted in the plans with instruction to the Consultant. Limits of disturbance shall be included and will be based on the proposed grading. Attention must be placed on existing utilities in order to effectively plan the design around their locations, or alternatively to coordinate relocation of utilities with utility companies during the design process. The plans must be prepared and sealed by a Professional Engineer, licensed in the state of Maryland.

The Consultant shall clearly state whether they intend to sub-contract any portion of the work herein. The names of all subconsultants together with a description and anticipated percentage of the work being sub-contracted are to be provided. The description also shall include a detailed breakdown of the cost with hours and rates for the tasks to be completed by the subconsultant. The Consultant assumes full liability for the performance of all subconsultants.

As part of this Task Order, the Consultant must warrant that it will not engage in providing consulting or other services to any private entity regarding the property within the project area during the term of the project. This requirement is intended to avoid the appearance of any conflict of interest that may arise.

DPW will assist the successful Consultant by providing applicable background information from record files, if available; as well as general guidance and liaison services to other City agencies.

#### **Services to be provided will include:**

##### **1) Field Visit and Background Review**

A thorough review of the existing conditions and background research is necessary. The Consultant shall:

- a) Review the completed feasibility study.
- b) Conduct a thorough field visit with City staff to identify existing conditions, evaluate existing infrastructure, determine constraints, and discuss layout options. The consultant is responsible for field verification.
- c) Conduct a discussion with Maryland Department of Transportation State Highway Administration staff to identify existing conditions, constraints, and possible signal, phasing, and intersection improvements for the intersection of Monroe Street and E. Jefferson Street (MD 28).

##### **2) Survey**

A detailed survey of the project vicinity showing existing conditions and features is required. Refer to "Attachment A" for the survey project limits. The survey should include both sides of the road. The survey should include the complete rights-of-way along Fleet Street and along Monroe Street and should extend beyond the rights-of-way to other areas where there might be drainage issues, tree impacts, or temporary property easements.

Survey services to be provided shall include the preparation and submittal of utility information request letters to any and all utility companies who have existing or known proposed facilities within the project limits. It may be necessary to coordinate beyond the initial letter with utility companies in order to collect utility information. The design should account for all utilities to allow for planning and coordinating possible relocations during the design phase.

The Consultant will need to enter adjacent private property to obtain survey information for this project. Consultant is responsible for notifying affected property owners via a door hanger or other written notification 48 hours prior to accessing private property. Written notification shall include a phone number and email contact for property owners who wish to 'opt out' and deny the Consultant access to their property. Consultant shall also attempt to notify property owners the day of surveying by knocking on the door prior to entering the

property for surveying. The Consultant shall provide the City with a plan or list of those properties to be notified.

Digital files shall be provided to the City in Microstation CAD or AutoCAD format, and in PDF. Surveys must be completed and signed by a Professional Land Surveyor, duly registered in the State of Maryland.

**The survey shall include the following:**

**a) Detailed Survey:**

- i) Public right-of-way and easement lines;
- ii) Property lines, addresses and owners;
- iii) Elevations and topography;
- iv) Roadway features (streetlights, medians, pavement markings, crosswalks, speed bumps, curb and gutter, pavement, sidewalks, signal poles, signal boxes, signal loops, signs, handicap ramps, driveways, aprons and lead walks, etc.);
- v) Environmental features (trees, shrubs, landscaping, etc.);
- vi) Existing utilities (water lines and valves, water meters, sewer lines, manholes, cleanouts, water and sewer house connections, storm drain pipes and inlets, gas lines and valves, power poles, guy wires, overhead wires, etc.);
- vii) All other features (fences, steps, walls, handrails, etc.);
- viii) Survey must be completed by a Professional Land Surveyor, registered in the State of Maryland;
- ix) Elevations and topography must be based upon a field run survey;
- x) The horizontal datum of the survey shall be based on grid north, Maryland State Plan Coordinate System North American Datum 1983/1991. The vertical datum shall be based on North American Vertical Datum, 1988 adjustment (NAVD 1988);
- xi) Provide two permanent benchmarks (outside of the project LOD) with horizontal and vertical control for construction and stakeout by others;
- xii) Existing contours at 1' intervals;
- xiii) Use standard base sheets provided by the City to plot final construction drawings at 20 scale or some other appropriate scale approved by the City; DPW's current CAD system is AutoCAD Civil 3D 2014.

**b) Utilities:**

- i) Subsurface Utility Engineering Quality Level B, as defined here:  
<http://www.fhwa.dot.gov/programadmin/sueindex.cfm>
- ii) All surface utility features (valves, valve boxes, manholes, inlets, etc.) must have top elevations, and inlet size of throat.
- iii) Sanitary Sewer and Storm Drain Systems must have field recorded invert elevations in and out, pipe size and material type.
- iv) MISS UTILITY must be called to locate all utilities prior to field surveying.

**c) Tree Survey:**

- i) All trees within fifty (50) feet of the LOD should be surveyed.
- ii) Locate, identify and show all trees 2" or greater in diameter (DBH) located within the right of way and all trees 6" or greater DBH within 25' from the anticipated limits of disturbance.
- iii) Graphically show the critical root zones (CRZ's) for the above trees under #18 as 1.5 foot of CRZ radius for every 1.0" of DBH.
- iv) Include separate tree tables (right of way trees and private trees) showing the tree number corresponding to the plan with the type (common name), size (DBH) and condition rating.
- v) Provide a Natural Resources Inventory (NRI), consistent with the City of Rockville requirements.
- vi) The tree survey shall be prepared by an ISA Certified Arborist and will be reviewed by the City Forester's office. The tree survey may be prepared on separate sheets to enable readability of the plan.

### 3) Design Plan

The design plans at all submissions (30%, 60%, and 90%) shall utilize the city's standard notes, borders, and details when applicable. The plans shall use a base plan based on all detailed surveys, existing plans, and aerial maps. Plans should be inclusive of a title sheet, general notes sheets, necessary construction plan sheets for each roadway, intersection, and applicable details and standards.

The Consultant shall submit design plans at all submissions (30%, 60%, and 90%) in Microstation CAD or AutoCAD format and viewable in PDF.

**The design plan shall include the following:**

**Compliance with construction specifications and standards, including all subsequent addenda, amendments, errata, and updates.**

- Maryland Department of Transportation, State Highway Administration, "Standard Specifications for Construction and Materials", latest edition. MDSHA Book of Standards for Highway and Incidental Structures.
- Montgomery County Department of Transportation, "Montgomery County Road Construction Code and Standard Specifications."
- Montgomery County, "Complete Streets Design Guide."
- Montgomery County Storm Drain Design Criteria.
- Standard Specifications of WSSC dated July 2013, or latest edition.
- Montgomery County Department of Transportation, "Design Standards."
- Maryland Department of the Environment "2011 Standards and Specifications Soil Erosion and Sediment Control."
- The State of Maryland Department of Transportation, "Manual on Uniform Traffic Control Devices."
- American Association of State Highway and Transportation Officials, "AASHTO Design Guidelines", latest edition
- American Association of State Highway and Transportation Officials, "Guide for the Development of Bicycle Facilities,"
- Montgomery County Noise Ordinance.
- Rockville City Code.

#### a) Civil Plans

##### i) Grade establishment

- (1) Horizontal and vertical geometric alignments of the roadway, sidewalk, shared-use path, and all facilities within the right of way.
- (2) Roadway centerlines with stationing at 50 foot intervals. Include all right-of-way lines, property lines, curb and gutter and paving lines. Include the paving and right of way width, as well as the sidewalk and driveway widths. Include the stations of PC, PT of fillets, high and low points.
- (3) Proposed stations and centerline elevations at 50 foot intervals, and at 25 foot intervals in vertical curves. Include proposed stations and centerline elevations at intersections, and connections with proposed roads and existing roads. Include the stations and elevations of PVC, PVT, and PVI. Include the stations and elevations of high points, low points, and grade breaks. Include existing and proposed culverts and pipe crossings. Proper sight distance and vertical curve length shall be based on AASHTO requirements.
- (4) Stations shall increase in south-to-north and west-to-east fashion
- (5) Cross sections shall be prepared through the right of way and beyond tying the proposed grade to existing grade and showing all horizontal dimensions, material, grade breaks, slopes, and elevations. The sections shall be prepared at each driveway and at high and low points of the road's centerline, or at a minimum spacing of 50 feet.

##### ii) Streetscape

- (1) Utility/streetlight pole location.
- (2) Existing/planned trees.
- (3) All proposed landscaping and buffers.
- (4) Parking meter locations and street furniture



- (5) Bus stops and bus stop facilities.
- (6) Shared-use path, sidewalks and curb ramps, and retaining walls.
- (7) Curb and gutter.
- (8) Limit of Disturbance

iii) Storm drain and paving

The Consultant shall prepare and submit public improvement plans for City utilities utilizing the following assumptions and minimum requirements:

- (1) All existing curbs and gutters, paving, and sidewalks, as well as all utilities and infrastructure, and buildings. Make existing features lighter or screened from proposed improvements.
  - (2) Streams, drainage ways, wetlands, and the 100-year floodplain.
  - (3) Drainage area map including all areas, right-of-way and offsite, which drain through project limits.
  - (4) Storm drain pipe size shall be sized to convey the 10-year storm event.
  - (5) Storm drain pipe schedule showing lengths, pipe sizes, materials, and class or gauge. Include a structure schedule showing structure types, stations, offsets from centerline elevations, dimensions. Include structure numbers on plan to match structure schedule, pipe profiles, and drainage study. Show the 10- and 100-year WSEL at sump inlets and overflow path for runoff. Include details of special structures. Show direction of safe over land flow with flow arrows.
  - (6) Storm drain profiles with structure numbers to match the plan, structure schedule, and drainage study. Show pipe lengths by stationing at each structure. Include the pipe size, material, slope, and class or gauge for each run. Include pipe inverts, discharge, velocity, and friction slope. Show existing and proposed grades. Label streets at the centerline where the pipe crosses the street. Show the hydraulic gradient. Provide a minimum of one foot clearance between all pipes (storm drain, water, sewer, dry utilities). Provide adequate cover over pipes. Show 10-year and 100-year WSEL at outfalls
  - (7) Adequate inlet spacing, sizing, spread, stable discharge area, storm drain pipe computations and spread computations for the 10-year Hydraulic Grade Line for any new storm drainage system.
  - (8) Assume no downstream improvements are required.
  - (9) All necessary storm drain computations shall be submitted as a design study and report.
  - (10) City of Rockville DPW standard notes, details, and Paving and/or Storm Drain Plan Review checklist shall be utilized.
  - (11) Proposed storm drain must be designed in accordance with Montgomery County Drainage Design Criteria.
- iv) The Consultant shall submit, obtain approval, and receive any required permits, including access and maintenance of traffic permits, for construction within the MDOT SHA right-of-way from the MDOT SHA District 3 Office of Construction for the proposed project.

**b) Optional Task: Water and Sewer**

At this point in time, it is unclear if water and sewer will require relocation. Following detailed survey with locations of existing utilities, and the preliminary curb and shared-use path alignment as developed, the determination for water and sewer relocation will need to be made. Should water and sewer relocations be necessary, the Consultant shall prepare and submit public improvement plans for City utilities utilizing the following assumptions and minimum requirements:

- i) Proposed water and sewer relocation requirements:
  - (1) Existing watermains shall be relocated outside of the proposed shared use path and curb line so as to be accessible for maintenance. Watermains should be located seven (7) feet off centerline of proposed curb and gutter.
  - (2) Existing fire hydrants shall be relocated into the proposed grass buffer in accordance with WSSC Pipeline Design Manual and Standard Details for Construction, 2' from the face of curb or no more than 7' from the face of curb.

- (3) Proposed water and sewer must be designed in accordance with WSSC Pipeline Design Manual and Standard Details for Construction. City of Rockville DPW standard notes, details, and Water and Sewer Review checklist shall be utilized.
- ii) Water and Sewer Pipe and Structure Schedule with material list.

**c) Stormwater Management (SWM)**

The Consultant shall prepare and submit a Combined Pre-Application and Development SWM Concept, in accordance with Chapter 19 of the City Code, including the requirement to provide SWM via Environmental Site Design (ESD) to the Maximum Extent Practicable (MEP). The SWM Concept shall be developed utilizing the following assumptions:

- i) The project will be considered a “Redevelopment” for the SWM Ordinance purposes.
- ii) SWM must be provided for the new and replaced impervious areas within the project Limit of Disturbance.
- iii) At a minimum, SWM control must be provided for Water Quality Volume (WQv), Channel Protection Volume (Cpv), and Overbank Flood Protection Volume (Qp10). Extreme flood control SWM is not required.
- iv) SWM must be provided in accordance with priorities established by the code in Sec. 19-44. ESD is the first priority, followed by a structural water quality system and then Alternatives as described in Sec. 19-50, including monetary contribution.
- v) For development of the concept, the Consultant shall investigate underground structural facilities. Include information to support the vertical aspects of the SWM System which may include existing and proposed inverts at critical locations and/or schematic profiles based on field verified information. Water quality storm drain devices must be located to allow easy access and maintenance and may not be located on a trunk line. Provide adequate utility clearances, including minimum of one foot clearance between all pipes (storm drain, water, sewer, dry utilities).
- vi) Provide adequate justification if it is not feasible to provide ESD or other SWM measures within the right-of-way.
- vii) Geotechnical testing will not be required during SWM concept stage. The concept should utilize the USDA NRCS web soil survey map and data to identify soil type. Section I – Geotechnical Report, as detailed in the Stormwater Management Concept Checklist, will not be required.
- viii) The concept should present measures to treat the target  $P_E$  but a minimum of 1-inch must be treated by ESD measures, structural systems, alternatives or a combination of the three.

Minimum SWM requirements shall be established by the City of Rockville Chief of Engineering in conjunction with the review and approval of the Combined SWM Concept.

**d) Optional Task: Approved Storm Water Design**

Until concept approval, the extent of effort for the SWM design is unknown. The proposal shall include the following task as an optional item:

- i) Preparation of construction drawings, specifications, and cost estimates for SWM shall be provided as a separate cost for all approved SWM measures and alternatives. When the concept is approved, if necessary, the relevant option(s) will be authorized, and the design will be completed for those elements, at the cost provided.
- ii) Based on the approved Stormwater Management design plan, the consultant shall prepare and submit a Stormwater Management Permit Application to the Engineering Division of DPW.

**e) Forest Conservation Plan**

- i) The Forest Conservation Plan (FCP) is to be included in and submitted with all submissions. The submission shall include the FCP checklist and application.
- ii) Limits of disturbance including staging areas, locations of sediment control measures and tree protection fence, proposed grading, utility relocations, any other improvements proposed by the project (signs, aprons, etc.).
- iii) Existing trees from the Tree Survey and all tree removals. All trees within fifty (50) feet of the LOD shall be surveyed.

- iv) Tree mitigation measures such as root pruning, crown elevating, etc., as applicable, for trees to be saved.
- v) An updated tree table showing the disposition as either “save” or “remove” for all trees shown on the Tree Survey as well as the number of replacement trees owed (right of way trees replaced at 1:1, private trees replaced per the City’s Forest and Tree Preservation Ordinance).
- vi) Tree replacement planting locations and a plant list with specific tree types and sizes (2.5” caliper for shade and ornamental trees and 7-8’ high for evergreen trees) for all replacement trees owed.
- vii) This project is not subject to afforestation.
- viii) The Forest Conservation Plan shall demonstrate compliance with the City of Rockville Forest and Tree Preservation Ordinance (FTPO) and Forest Conservation Manual.
- ix) The NRI/FSD or existing conditions plan should accompany the Forest Conservation Plan.
- x) Based on the approved Forest Conservation Plan, the consultant shall prepare and submit a Forestry Permit Application to forestry reviewers within the Department of Community Planning and Development Services in accordance with the application requirements.

**f) Utilities**

- i) Non-City Utilities: At the onset of the project, the Consultant shall request as-built plans from utility companies (PEPCO, Washington Gas, Comcast, and Verizon). The Consultant’s design plans shall include all utilities existing along the right-of-way and beyond within surveyed area. At the 30% design phase, utility conflicts shall be identified and shared with private utilities. Final plans shall incorporate private utility relocation plans, if necessary. In the event of impact to utilities within the State Highway Administration right-of-way, the Consultant shall determine the date the right-of-way was acquired by the utility company (or the date said utility was installed), and the date the State/Public acquired the right-of- way.
- ii) City Utilities – Water and Sewer: Rockville provides water and sewer along both Fleet Street and Monroe Street. Consultant must coordinate with each utility to ensure proper relocations, as necessary. See section 3b for further discussion of water and sewer.
- iii) Hiring of a utility consultant should be considered by the applicant if they do not have the expertise in-house

**g) Signing and Marking**

- i) Existing signs, pavements markings, traffic control devices, parking spaces, buffers, etc.
- ii) Proposed signs and pavement markings, traffic control devices, parking spaces, transition areas, buffers, etc.

**h) Traffic Signal**

- i) Traffic signal plans for Fleet Street & Monroe Street and for Monroe Street & E. Jefferson Street (MD 28).
- ii) Existing and proposed traffic equipment, signs, and wire.
- iii) Right-of-way.
- iv) Phasing diagrams.
- v) Wiring diagrams.
- vi) Interim approvals per MUTCD for potential improvements, if necessary.
- vii) The Consultant shall submit, obtain approval, and receive any required permits for the traffic signal plans from the MDOT SHA, Montgomery County Department of Transportation, and the MDOT SHA District 3 Office of Construction for the intersection of Monroe Street and E. Jefferson Street (MD 28).

**i) Erosion and Sediment Control Plan (SCP)**

As part of the construction drawings, the consultant shall propose measures for adequate sediment and erosion control during the construction of this project. The erosion and sediment control plans shall be submitted with the 60% and 90% design plan submissions and shall include:

- i) limits of disturbance,
- ii) sediment control measures (silt fence, inlet protection, etc.),
- iii) sequence of construction, including construction access, phasing, staging and detailed description of steps to complete the project.
- iv) appropriate sediment control notes and details.

- v) Owner/developer certifications and must be coordinated with the Forest Conservation Plan and utilize the same scale.

Based on the approved Preliminary Sediment Control Plan, the consultant shall prepare and submit a Sediment Control Permit Application to DPW along with the sediment control plans, appropriate checklists, and computations for review and approval by DPW Engineering Division.

The plans must be prepared and sealed by a Professional Engineer, licensed in the state of Maryland.

**j) Maintenance of Traffic (Traffic control plan)**

- i) To be submitted with the 60% and 90% design plan submissions.
- ii) Flow of traffic for motor vehicles, pedestrians, bicyclists, and transit.
- iii) Detours for all modes according to construction phasing.
- iv) Proposed construction access to site and site utilization (stockpiles, employee parking, etc.)
- v) Pedestrian and vehicular access to adjacent buildings and property must be maintained throughout construction.

**k) Cost Estimate**

- i) To be submitted with all submissions.
- ii) Final cost estimate shall match the itemized pay items and estimated quantities included in the plan, and exactly as shown on the bid sheet.

**4) Meetings**

- a) Kick-off meeting to be hosted virtually by Consultant within three weeks of purchase order.
- b) Monthly status meetings hosted by virtually by Consultant for the duration of the project.
- c) 30% design review meeting hosted by virtually by Consultant.
- d) 60% design review meeting hosted by virtually by Consultant.
- e) 90% design review meeting hosted by virtually by Consultant.
  
- f) 30% design public meeting.**
  - i) Prepare slide presentation for one virtual public meeting to occur after 30% design review meeting.
  - ii) Attend public meeting and compile meeting notes including all submitted public comments.
  
- g) 90% design public meeting**
  - i) Prepare one set of printed plans.
  - ii) Attend in-person public meeting and support city staff, including taking notes and recording comments from the public.
  - iii) In-person public meeting will be held as a “walk-n-roll-the-block” style meeting.

**5) Technical Specifications and Bid Documents**

- a) To be submitted at 60%, 90% and with the final design plan submission.
- b) City will be responsible for compiling the Invitation For Bid (IFB),
- c) Consultant to prepare the technical specifications and methods of measurement for all proposed pay items to comprise Section 4 of the city’s standard IFB.
- d) Consultant shall provide the city with any unique special provisions for the project, should they be necessary to convey the intent of the work required, which will be incorporated into Section 3 of the city’s standard IFB.
- e) Consultant shall provide the pricing bid sheet of all pay items and estimated quantities for use in the final IFB, based on the format as provided by the city.

**6) Construction Phase Tasks**

Some construction phase involvement is requested. As the amount of involvement necessary is not currently known, estimates of hours for the project engineer to be included in the quote and proposal have been included below. If after award, it becomes apparent that these amounts need to be modified, a change to the purchase order can be made. The following tasks shall be included in the submitted quote and proposal as optional services:

**a) Optional Task: Review of shop drawings**

Review drawings for any aspect of the engineer's design prior to any fabrication, if required. Allocate 40 hours of time to be used, as necessary.

**b) Optional Task: Construction Inspection Services**

Provide construction inspection services during construction. Allocate 200 hours of time to be used, as necessary, for attendance at the pre-construction meeting, monthly progress meetings, responding to questions during construction, review/approve change orders, develop punch list, making site visits when requested, and the development of plan revisions.

Note: It is the engineer's responsibility to identify and include any additional items in the submitted Cost Proposal necessary to complete the work anticipated by this task order. The City recommends the proposers visit these intersections prior to submitting the Cost Proposal to identify any items beyond those listed in this request for quote. Items added must be clearly identified in the tasks and cost proposal.

**Expected Deliverables**

All design plan elements listed above are to be submitted at the 30%, 60%, 90%, and final design submissions, unless noted above.

**1) Submittal One – 30% Design**

This submittal shall be 30% design plans that incorporate the concept plans developed previously for a road diet and shared use path along Fleet Street between Maryland Avenue and Richard Montgomery High School, and along Monroe Street between Fleet Street and E. Middle Lane. The City will require the Consultant to address all comments from the 30% plans identified through the City's review of the submittal. City approval of these plans will allow the Consultant to proceed with the preparation of the 60% plan.

**2) Submittal Two – 60% Design**

This submittal shall address all issues and/or comments raised during the City review of the 30% design. It shall include complete construction plans including all details, notes, and specifications required to complete the project, and an updated estimate. It shall also include the first draft of the technical specifications and other bid documents. The City will require the Consultant to address all comments from the 60% plans identified through the City's review of the submittal. City approval of these plans will allow the Consultant to proceed with the preparation of the 90% plans.

**3) Submittal Three – 90% Design**

This submittal shall address all issues and/or comments raised during the City review of the 60% design. It shall include complete construction plans including all details, notes, and specifications required to complete the project, and an updated estimate. City approval of these documents and plans allow the Consultant to proceed with the preparation the final construction plans and bid documents. Design plans, construction specifications and cost estimates shall be included in the 90% Design submittal.

**4) Submittal Four – Final Design**

Final Design: The final submittal shall address all issues and/or comments raised during the City reviews of previous submittals. The final design package shall include the following:

- (1) Digital submittals of all documents, including Microstation CAD or AutoCAD version, and PDF.
- (2) Sealed Technical Specifications and construction estimates.
- (3) Any other final reports generated during the design process other bid related documents.

### **Anticipated Schedule**

| <b>Milestone</b>                                  | <b>Date</b>   |
|---------------------------------------------------|---------------|
| Submit Quote/proposal                             | December 2025 |
| Contract Award/Issue Purchase Order               | April 2026    |
| Kickoff Meeting                                   | April 2026    |
| Submittal One – 30% Design Plan                   | May 2026      |
| 30% Design Public Meeting                         | June 2026     |
| Submittal Two – 60% Design Plan                   | August 2026   |
| Submittal Three – 90% Design Plan                 | October 2026  |
| 90% Design Public Meeting                         | November 2026 |
| Submittal Four – Final Design Plan, Bid documents | January 2027  |

The Firm selected for contract award may be required to develop a knowledge and project transition plan that outlines a step-by-step process to reach a smooth transition from the current project delivery and support team to new Firms. The transition plan may include a combination of a series of meetings, documents, checklists, or other means to gather the information and project history and background to move forward effectively and efficiently without delay.

The Firms must use Bentley ProjectWise for data storage and management for all project files or propose an alternative system for City of Rockville consideration and approval.

The Consultants shall, at their own cost, provide industry-standard software applications and platforms to perform all services required in this RFP. These applications and platforms may need to be compatible with City of Rockville systems and may include, but are not limited to, the following functions:

- a. Microsoft Office Suite
- b. Adobe Suite;
- c. Bluebeam Construction Software;

Periodically, new guidelines, processes, laws, and mandates may require additional activities not clearly cited in the RFP. All activities required to deliver a project or program, whether new or existing, unless otherwise controlled by regulation or statute, will be completed under this contract. If special skills or services are identified that are beyond the expertise of the consultant, then new subconsultants may be required to be added to the contract to support project delivery.

This is not an all-inclusive list as this contract may include other professional services related to the scope outlined above.

There may be instances when City of Rockville requires the consultant to provide emergency response times for a given project. Therefore, the consultant may be required to provide those services within twenty-four (24) hours of notification or as otherwise directed by the City of Rockville.

### **3. Certifications**

Individuals supplied by the Consultants shall have the following Certifications: Professional Engineer (PE) for engineering activities, American Institute of Certified Planners (AICP) accreditation for planning activities, and Professional Land Surveyor (PLS) for surveying activities. The cost to achieve the various certifications, re-certifications, and Core Training, including course costs, time and mileage to attend the training/testing, shall be paid for by the Consultant Firms or the individual Consultants, not City of Rockville. Other related training may also be required based on changing City of Rockville policies. Consultants are expected to make reasonable accommodations for their staff to attend training.

### **4. Safety Items**

The Consultants shall supply all required personal protective equipment and safety items necessary to perform the scope of work. All equipment must comply with SHA's High Visibility Apparel Policy, SHA's

Office of Construction's Directive on Personal Protective Equipment (PPE), and all OSHA and MOSH regulations.

**5. Equipment**

The consultant shall supply all necessary tools, equipment, and items needed to perform the scope of work.

The consultant will be required to supply all other tools and equipment not listed in order to perform the scope of work referenced in the solicitation.

**6. Engineering Standards and Guidelines**

The Consultants shall perform all contract engineering services in accordance with good industry practice, all applicable laws and regulations, and the current editions of the following references, their interim specifications, their successor replacement references, and all other pertinent guidelines and memoranda as released by FHWA, AASHTO, and SHA including, but not limited to the following publications:

- a. MDOT "General Conditions for Consulting Services" dated January 1989;
- b. SHA "Specifications for Consulting Engineers' Services" dated April, 1986;
- c. SHA "Request for Proposal" dated April, 2002;
- d. SHA Transportation Alternatives Program Manual
- e. SHA Development Guide for Local Public Agencies and Other Sub-Recipients of Federal Funds
- f. Maryland Department of Transportation, State Highway Administration, "Standard Specifications for Construction and Materials", latest edition. MDSHA Book of Standards for Highway and Incidental Structures.
- g. Montgomery County Department of Transportation, "Montgomery County Road Construction Code and Standard Specifications."
- h. Montgomery County, "Complete Streets Design Guide."
- i. Montgomery County Storm Drain Design Criteria.
- j. Standard Specifications of WSSC dated July 2013, or latest edition.
- k. Montgomery County Department of Transportation, "Design Standards."
- l. Maryland Department of the Environment "2011 Standards and Specifications Soil Erosion and Sediment Control."
- m. The State of Maryland Department of Transportation, "Manual on Uniform Traffic Control Devices."
- n. American Association of State Highway and Transportation Officials, "AASHTO Design Guidelines", latest edition
- o. American Association of State Highway and Transportation Officials, "Guide for the Development of Bicycle Facilities,"
- p. Montgomery County Noise Ordinance.
- q. Rockville City Code.

**7. General Requirements**

The Consultants shall not enter onto private property for any purpose until authorized by City of Rockville. The Consultants must notify City of Rockville immediately if damage occurs to property and shall be responsible for any such damage. The Consultants may also be authorized to subcontract for specialties with prior approval of SHA as direct expenses that shall be discussed during the price proposal negotiations for selected awardees. Examples may include field surveys, tree identification, etc.

No payment for overtime work shall be made without authorization from City of Rockville. When overtime is required and authorized, and when payment therefore may involve premium costs, there shall be no payroll additive.

Premium overtime costs are reimbursable as a direct cost when an employee works more than forty (40) hours per week on City of Rockville projects based upon the Consultant's work week. Regularly scheduled paid company holidays may be included in the calculation of "hours worked", but time off for any other leave (e.g. vacation, personal, compensatory or sick leave) is to be excluded from "hours worked" when calculating premium time reimbursement. The fact that an employee works more than eight (8) hours in a single day does not necessarily mean that premium overtime costs are allowable as a direct cost since

reimbursement is determined on a weekly basis. Any premium overtime paid to employees, but not directly billable under this policy, may not be allowed as an indirect cost.

**8. Special Requirements – Disadvantaged Business Enterprise (DBE) Provisions:**

The MDOT hereby notifies all proposers that with regard to any contract entered pursuant to this solicitation, Disadvantaged Business Enterprise (DBE) firms will be afforded full opportunity to participate in response to this solicitation. DBE is a for-profit small business concern (1) That is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals; and (2) Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it (49 CFR 26.5).

A socially and economically disadvantaged individual is one who is a citizen (or lawfully admitted permanent resident) of the United States and who has been subjected to racial or ethnic prejudice or cultural bias within American society because of his or her identity as a member of groups and without regard to his or her individual qualities. The social disadvantage must stem from circumstances beyond the individual's control. (49 CFR 26.5)

The MDOT hereby notifies all eligible proposers that with regard to any contract entered pursuant to this solicitation, Disadvantaged Business Enterprise (DBE) firms will be afforded full opportunity to participate in response to this solicitation and will not be subject to discrimination on the basis of race, color, national origin, age, sex or disability in consideration for an award (23 CFR § 200, 49 CFR § 21 and 26, and 49 CFR 27.19 and Section 504 of the Rehabilitation Act of 1973).

It is the goal of MDOT that certified DBE businesses participate in all federal-aid contracts. Each contract may contain a goal for DBE participation, on a contract-by-contract basis. Consultants interested in submitting a Technical Proposal in response to this solicitation must comply with the SPECIAL PROVISIONS, AFFIRMATIVE ACTION REQUIREMENTS, UTILIZATION OF DISADVANTAGED BUSINESSES, THE SURFACE TRANSPORTATION AND UNIFORM RELOCATION ASSISTANCE ACT OF 1987, ISTEA 1991, MAP 21 OF 2012, FAST Act 2015, AND INFRASTRUCTURE INVESTMENT AND JOBS ACT OF 2021.

To comply with the aforesaid SPECIAL PROVISIONS, Consultants who submit Technical Proposals must clearly set forth the DBE Prime firm(s) and DBE subcontractor(s) proposed for goal attainment indicating:

- a. Firm's name and address,
- b. The proposed work,
- c. Percentage of total work,
- d. MDOT certification number, and
- e. Applicable NAICS Codes

**NOTE #1:** DBE firms must be certified for the specific work to be performed to count their participation towards meeting the DBE participation goal. Only include the applicable NAICS Code(s) for the services/work the DBE firm is proposed to perform in support of the contract.

**NOTE #2:** DBE firms must be certified by MDOT in those NAICS code(s) at the time of the Technical Proposal submission and remain certified through contract award by MDOT to participate on federally funded contracts.

**NOTE #3:** Guidelines Regarding DBE Prime Self-Performance. Please note that when a certified DBE firm participates as a prime contractor (including a prime participating as a JV) on a contract, a procurement agency may count the distinct, clearly defined portion of the work of the contract that the certified DBE firm performs with its own forces.



A current directory of certified DBE firms is available through the MDOT Office of Minority Business Enterprise, 7201 Corporate Center Drive, Hanover, MD 21076. The phone numbers are (410) 865-1269, 1-800-544-6056, or TTY (410) 865-1342. The directory is also available on the MDOT website at <https://marylandmdbe.mdbecert.com/>. The most current and up-to-date information on DBE firms is available via this website. **Only MDOT-certified DBEs may be used to meet the DBE goals.**

The Consultant's failure to submit all the required DBE information, in the specified areas, will result in the Consultant being disqualified from further consideration on these contracts, unless it is in the best interest of the State to seek clarification or additional information from the Consultant Firm.

a. Contract Goals

An overall goal has been established for DBE participation for this Contract located in Section 3 G of this RFP. DBE proposers must meet the established DBE goal by either their own forces or approved DBE Subconsultant(s). When an DBE performs as a participant in a JV (as described in 49 CFR Part 26.5), they may count a portion of the total dollar value of the contract equal to the distinct and clearly defined portion of the work that the DBE performs with its own forces, toward the DBE goals and the proposed participation must be listed in Section 3 11 of SF 330.

In addition to listing the DBEs, Consultants must also list each non-DBE firm proposed in Section 3 of the SF 330 including the proposed work and percentage of work in Section 3 11 of SF 330.

The Contractor is encouraged to use a diverse group of subcontractors from any/all of the various DBE classifications to meet the overall DBE participation goal.

b. The following DBE participation instructions, and forms are provided on SHA's website at <https://www.roads.maryland.gov/mdotsha/pages/index.aspx?PageId=767> to assist Offerors/Offerors:

- MDOT Federal DBE Form A – DBE Utilization and Fair Solicitation Affidavit (**must submit with Technical Proposal**)
- MDOT Federal DBE Form B DBE Participation Schedule (**must submit with Technical Proposal**)
- MDOT Federal DBE Form C – Outreach Efforts Compliance Statement
- MDOT Federal DBE Form D – DBE Subcontractor Contract Participation Affidavit
- MDOT Federal DBE Form E – Good Faith Efforts Guidance and Documentation

By submitting a response to this solicitation, the Offeror acknowledges the overall DBE subcontractor participation goal, and commits to achieving the goal by utilizing MDOT certified disadvantaged business enterprises. A Bidder/Offeror must make Good Faith Efforts to meet the DBE goal set for this procurement. If a Bidder/Offeror is unable to achieve the goal, the MDOT DBE Form E – Good Faith Efforts Guidance and Documentation must be completed within ten (10) Working Days from notification that it is the recommended awardee or from the date of the actual award, whichever is earlier, as required in COMAR 21.11.03.11.

As set forth in COMAR 21.11.03.12-1, once the contract work begins, the work performed by a certified DBE firm, including a DBE prime, can only be counted towards the DBE participation goal(s) if the DBE firm is performing a commercially useful function on the contract.

## SECTION 3

### **Technical Proposal Required Information**

U.S. Government forms are to be completed with standard size typing and are not to be photo reduced. Computer generated forms are acceptable; however, the format and spacing is to be identical to that of the Standard Forms 330.

With the exception of Government forms and the Organizational Chart, all pages included with your Technical Proposal submission are required to be standard 8½ x 11 size paper with a minimum of a one-inch margin on all sides and no smaller than 10-point Times New Roman font. Attachments to the Proposal are unacceptable.

**SHA must be notified in writing, by email to Bryan Barnett-Woods, [bbwoods@rockvillemd.gov](mailto:bbwoods@rockvillemd.gov), of any deletions, additions, and/or substitutions of proposed Subconsultants after Technical Proposals have been submitted.**

#### **A. Cover Letter**

Cover Letter on the Firm's/JV's letterhead – limited to 2 pages, which must contain:

- i. The names, contact numbers and email addresses of the Primary Liaison, Disadvantaged Business Enterprise (DBE) Consultant Liaison Officer for Minority Affairs, and your firm's contact person for this procurement process. The Primary Liaison, DBE Liaison Officer, and the firm's procurement contact may be the same or different individuals.
- ii. The e-mail address of the contact person for this contract. Future correspondence related to this contract, prior to award of a contract, may be transmitted via e-mail.
- iii. The information that the Firm/JV have the financial capacity to provide the services and has measures of protection for the State against errors and omissions.
- iv. Certification that the Firm/JV have read and fully understand the requirements set forth to be provided for this RFP.
- v. Certification that the Firm/JV and proposed team possesses the expertise, resources, knowledge, and technical ability to perform all elements of the contract's scope and deliver all the requirements set forth through its own forces and those of its subcontractors.
- vi. Certification that Key Staff individuals meet the education, experience, certification/registration and expertise requirements set forth in this RFP.
- vii. This letter shall be signed by the person or persons able to legally bind the Firm to the proposal.
- viii. Corporate Resolutions shall be included if signed by anyone other than the President of the Firm or Executive for the JV.

#### **B. Scope**

The Consultant must submit a maximum of two (2) page document certifying the contract's Scope can be performed in its entirety through its own forces and those of its subconsultants. This section of the proposal should provide information to confirm the Offeror has a reasonable probability of success in meeting the project's quantity, quality and schedule requirements.

#### **C. Work Plan**

The Consultant must submit a maximum of six (6) page work plan detailing their ability to perform the consultant services required, scope of work, etc. to make up their Work Plan submission. Work Plan shall include, at a minimum, the following information:

- i. Has read and fully understands the requirements set forth to be provided for this contract;
- ii. The Consultant team possess the experience, resources, knowledge and technical ability to perform and deliver all the requirements set forth in this contract;
- iii. Acknowledges this is a project-specific contract and understands the requirements for schedules and/or deadlines to provide deliverables, services, etc.;
- iv. Has a detailed work plan in place to ensure schedules and/or deadlines will be met as well as achieving the DBE goal;
- v. The work plan includes comprehensive quality assurance and quality control program; and
- vi. Other statements are at the discretion of the Consultant as this is not an all-inclusive list.

**D. Standard Form 330 Parts I and Parts II**

Completed US Government Standard Forms (SF) 330 Parts I and Parts II for the Prime and for each proposed subcontractor. The SF 330 forms must be completed in their entirety paying special attention to the following:

- i. Outside Key Consultants (Sub-Consultants) should be documented in Part I, Section C of the SF 330. Please follow the directions provided in Section 8 within “Special Requirements – DBE Provisions” to complete Section C 11 for MDOT certified DBE firms.
- ii. The Organizational Chart required for Part I, Section D of SF 330 shall be placed within the *Standard Form 330 Parts I and Parts II* of the Technical Proposal and must contain, at a minimum, the Key Personnel and defining team organization with supplemental support personnel. In addition, for every individual proposed for this contract and shown on the organization chart, the chart shall clearly show their company affiliation and their permanent office location. The Organization Chart shall be limited to an 11 x 17-inch page with Times New Roman Font size 10-point or larger.

In addition, a two (2) page matrix style of support personnel shall be included in the *Standard Form 330 Parts I and Parts II* of the Technical Proposal. Matrix style is defined as names listed on the vertical axis and Relative Experience identified on the horizontal axis. The support personnel descriptions are limited to six (6) lines per individual. The support personnel Matrix shall be limited to an 11 x 17-inch page with no smaller than 10-point Times New Roman Font size and one-inch margins.

- iii. Part I, Section E of the SF 330, Key Staff. A separate Section E form should be completed for each Key Staff individual proposed. Provide a resume for each of the Key Staff individuals outlined below, limited to one (1) Key Staff per page, not to exceed eight (8) pages total. **The experience for each individual Key Staff as described below shall be recent experience performed within the last five (5) years.** Years of experience and applicable licenses and certifications, such as a professional Engineer license, American Institute of Certified Planners or similar, shall be clearly documented on each resume.
- iv. SF 330 Section F – Example Projects Which Best Illustrate Proposed Team’s Qualifications: Limited to four (4) example projects one (1) example project per page for a total not to exceed four (4) pages. Photos are acceptable; however, all photos count in the overall space limitations for the page and are considered illustrations and are not rated. The Example Projects set forth shall be recent relevant experience performed within the past five (5) years. (Information provided in this section shall become part of the rating/evaluation criteria for this project).

Example projects should include 100% design plans for shared use paths, on-road cycle tracks, and sidewalks, as well as complete streets design project along a corridor with signalized intersections.

- v. SF 330 Section H – This section shall be limited to one (1) page and must certify that the Key Staff individuals meet the education, experience, registration/licensure, expertise, and all other professional qualifications specified in this advertisement. Please exclude any confidential personal information.

**Additional Information regarding Key Staff replacements after Final Selection:**

Key Staff changes may only be requested after final selection if the Key Staff is no longer available to perform on the contract or at the request/agreement of City of Rockville. A letter outlining the reason for the change and the names of the Key Staff involved in the replacement request must be in writing on the firm's/JV's letterhead along with a one (1) page resume per the requirements outlined in this RFP.

Substitutions will be evaluated using the same qualifications-based technical rating criteria and the Key Staff replacement's score must be equal or higher than the original Key Staff's score in order to be accepted/approved by SHA. All scores will remain confidential by SHA. Instructions for completing a resume are included in Section 9 D – *Standard Forms Part I and II* of this RFP.

**E. Technical Questions:**

Technical question responses shall not exceed a total of five (5) pages, limited to one (1) page per question.

Reference the question number at the top of each page and use the remainder of the page for the response to the question (for example, "Question #1:");

- a. Question #1: What steps should a firm take during the shared-use path design process to evaluate, propose, and design a signalized intersection? What standards must be followed, and which agency must be involved?
- b. Question #2: What criteria are considered for designing shared-use paths along roadways? How are the criteria prioritized?
- c. Question #3: What elements need to be considered for surveying roadways segments and the surrounding area for an urban shared-use path project?
- d. Question #4: What plans are necessary to carry out a shared-use path construction project in an urban setting?
- e. Question #5: What steps can a firm take during the design phase to reduce or eliminate the number of change order requests during construction?

**F. Subcontractors Commitment – no page limits as this section may vary:**

The Technical Proposals are to be explicit with respect to the work to be performed by all subcontractors proposed. A Letter of Commitment is required for each proposed Sub-Consultant. While the format and overall content is at the firm's discretion, a Letter of Commitment must at a minimum:

- Be on the Sub-Consultant's letterhead;
- List the services proposed to be provided;
- Certify the firm is able to provide the required resources, services, etc.;
- List the applicable NAICS Codes for the services/work to be performed in support of the contract, and overall percentage of work to be performed for the contract;

- NAICS Codes must be the same as those listed in Section C 11 of the SF 330 for each subconsultant;
- Be signed and dated by the Principal/President of the firm; and
- If a firm is a MDOT Certified DBE, include the MDOT Certification number and applicable NAICS codes consistent with the work to be performed.

**G. DBE Compliance – the Consultant shall include the executed “MDOT DBE Forms (A&B)” – no page limits as this section may vary:**

There is a **zero percent (0%)** DBE goal established for this contract. DBE proposers must meet the established DBE goal by either their own forces or approved DBE subcontractor(s).

This section must include an introduction letter listing all the proposed MDOT Certified DBE firms, associated MDOT Certification Numbers, proposed work and percentages, NAICS codes applicable to the work to be performed, and the name and contact information of the DBE Consultant Liaison Officer for Minority Affairs. The introduction letter is not required to be on the firm's/JV's letterhead or signed and dated. The format is at the firm's discretion.

**H. Time Distribution – not to exceed 1 page consisting of the following:**

The Consultant shall include a 1 page listing of those classifications proposed for services and the percentages of time estimated for each classification. Percentages shall total one hundred percent (100%). The Consultant *shall not* include man-hour estimates in the Technical Proposal. A column of percentages of time estimated for each classification are to be shown for the Prime Consultant, for each subcontractor proposed, and one (1) column showing totals which add up to 100%. When multiple firms are used, the total for each firm must add up to something less than 100%. These percentages are applicable to the total dollar amount of the Price Proposal to be developed separately by the selected firm(s). The percentages are not applicable to time estimates. The Consultant shall indicate the number of simultaneous project assignments the Consultant and each Subconsultant could handle individually.

The following classifications and estimated percentages of time to be used for the contract assignments are:

| <b>Classification</b> | <b>Est. Office (%)</b> | <b>Est. Field (%)</b> | <b>Total (%)</b> |
|-----------------------|------------------------|-----------------------|------------------|
| Principal             | 0.4                    | 0.0                   | 0.4              |
| Project Manager       | 3.4                    | 1.0                   | 4                |
| Senior Engineer       | 18.9                   | 1.0                   | 20               |
| Junior Engineer       | 45.9                   | 2.0                   | 48               |
| Arborist              | 1.8                    | 2.0                   | 4                |
| Technician            | 16.4                   | 1.0                   | 17               |
| Surveyor              | 1.2                    | 5.0                   | 6                |
| <b>Total</b>          | <b>88</b>              | <b>12</b>             | <b>100</b>       |

**I. Financial Responsibility and Insurance Requirements:**

1. The consultant shall include a letter addressed to SHA setting forth evidence that the consultant has the financial capacity to provide the services and has measures of protection for the State against errors and omissions.
2. The Consultant shall include a copy of the firm's current certification(s) of insurance, which should contain, at minimum, the following:

- Carrier (name and address)
- Type of insurance
- Amount of coverage, which must include at a minimum of [\$1,000,000] per occurrence of Professional Liability
- Period covered by insurance; and
- Any exclusions

Insurance coverage will be one (1) of the areas evaluated when Technical Proposals are reviewed. Failure of the Consultant to submit satisfactorily to these requirements may result in SHA rejecting the proposal(s).

SHA requires the following minimum levels of insurance coverage for this contract:

a. Worker's Compensation and Employer's Liability

The Contractor shall, at all times, maintain and keep in force such insurance as will protect him from claims under the Worker's Compensation Act of the State of Maryland and maintain and keep Employer's Liability Insurance at a limit of One Million Dollars (\$1,000,000). The \$1,000,000 employer liability can be satisfied by an Umbrella/Excess Policy, as long as it is specific to "Employer's Liability".

b. Commercial General Liability Insurance

The Contractor shall maintain Commercial General Liability Insurance in the amount of at least One Million Dollars (\$1,000,000) Combined Single Limit for Bodily Injury Liability and Property Damage Liability Insurance per occurrence, and One Million Dollars (\$1,000,000) in the aggregate.

c. Comprehensive Automobile Liability Insurance

The Contractor shall maintain Comprehensive Automobile Liability Insurance (including all automotive equipment owned, operated, rented, or leased), in the amount of at least One Million Dollars (\$1,000,000). Combined Single Limit for bodily injury and property damage.

d. Professional Liability Insurance

The Contractor shall maintain Professional Liability Insurance in the amount of at least One Million Dollars (\$1,000,000).

In addition, the City of Rockville requires:

- e. Excess/Umbrella Liability for each occurrence/aggregate in the amount of at least One Million Dollars (\$1,000,000). City to be listed as additional insured and provided 30 day notice of cancellation or material change in coverage.

**Please see Attachment C for full City of Rockville insurance requirements.**

**J. Proposal Affidavits:**

As per State Finance and Procurement Article 17-701 – 17-707 of the Annotated Code of Maryland, a firm engaging in investment activities with companies appearing on the Investment Activities in Iran list is ineligible for bid/proposal/award. The Investment Activities list is located at [www.bpw.state.md.us](http://www.bpw.state.md.us) of the Maryland Board of Public Works (BPW) website. As per the BPW Advisory No.: 2013-1, Date Issued January 1, 2013, an officer of the Firm shall provide a signed original certification as per language stated on the BPW Advisory page. If the Firm is a JV, officers

from all companies forming the JV shall provide a signed original certification. NOTE – the Investment Activities in Iran certification is included in the bid/proposal affidavit.

In preparing its proposal on this contract, the Offeror has considered all proposals submitted from qualified, potential subcontractors and suppliers, and has not, in the solicitation, selection, or commercial treatment of any subcontractor, vendor, or supplier, refused to transact or terminated business activities, or taken other actions intended to limit commercial relations, with a person or entity on the basis of Israeli national origin, or residence or incorporation in Israel and its territories. The Offeror also has not retaliated against any person or other entity for reporting such refusal, termination, or commercially limiting actions. Without limiting any other provision of the solicitation for proposals for this contract, it is understood and agreed that, if this certification is false, such false certification will constitute grounds for the State to reject the proposal submitted by the Offeror on this contract, and terminate any contract awarded based on the bid/proposal.

All offerors are required to submit the following completed affidavits with their technical proposal within the *Proposal Affidavits* section. Both documents are available on the SHA OPCM website at <https://roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=767>

- Bid / Proposal Affidavit
  - Form is located under “Affidavits” section of the website
- Certification Regarding Discriminatory Boycotts of Israel
  - Form is located under the “Certification Regarding Discriminatory Boycotts of Israel” section of the website

9. **Services/Materials to be provided by City of Rockville:**

The City’s Department of Public Works (DPW) will provide the successful Consultant with existing traffic signal plans, general guidance, and liaison services to other City agencies. The City’s DPW will assist the successful Consultant by providing guidance and background material. This is not an all-inclusive list. City of Rockville may provide additional services/materials as appropriate.

10. **Progress Reports:**

The Consultant must submit monthly progress reports including a detailed account of work performed that is being billed, outstanding issues, summary of additional work requests, percent completed, any anticipated delays, etc. This report must be submitted with the monthly invoice.

11. **Records, Tasks and Notice to Proceed:**

The Consultant shall keep accurate records documenting the time, material, and transportation utilized, etc. Contract payment(s) to the Consultant for work completed will be made on this basis only.

The Consultant must be able to provide prompt consultant services within 14 working days of the contract’s Notice to Proceed.

No work shall be performed on contract by the Consultant until a written Notice to Proceed (NTP) is received by the Consultant from City of Rockville.

The Consultant must provide the required services within five (5) working days of an NTP for an approved assignment.

12. **Completion Date:**

The contract will terminate on the expiration date.

13. **Prompt Payment**

Pursuant to 49 CFR §26.29, MDOT requires prime contractors to pay subcontractors, at any tier, for satisfactory performance of their contracts no later than 30 days from receipt of each payment that City of Rockville makes to the prime contractor. When City of Rockville has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be

satisfactorily completed. To the extent that it is not inconsistent with federal law, all prime contractors shall also comply with all Maryland laws and regulations regarding the prompt payment to subcontractors.

**14. Due Date Deadline for Submissions**

**RESPOND BY FRIDAY, DECEMBER 05, 2025, PRIOR TO 2:00 PM (EST).** Only City Collaboration Portal submissions of the Technical Proposals submitted through [Contract Insight - Collaboration Portal \(rockvillemd.gov\)](https://rockvillemd.gov) will be accepted as described above.

The Procurement Officer and sole point of contact for this solicitation, unless directed otherwise within this solicitation or by SHA, is:

Jonathan Pierson, CPSM, C.P.M.  
Assistant Director  
Procurement Department  
City of Rockville, City Hall  
111 Maryland Avenue  
Rockville, Maryland 20850  
Phone: (240) 314-8433



## SECTION 4

### **Evaluation Criteria**

The major factors/criteria and their relative weight of importance to be used in evaluating Technical Proposals are:

| <b>Item</b>         | <b>Score</b> |
|---------------------|--------------|
| Technical Questions | 40%          |
| Key Staff           | 30%          |
| Work Plan           | 30%          |

The following items will be rated as either one of the following:

- (A) Acceptable-Response demonstrates they meet requirements
  - (U) Unacceptable-Response fails to demonstrate they meet requirements
  - (N) Neutral-Lacks prior SHA experience. Not a barrier to award
- 
- a. Scope of Services;
  - b. Example Projects;
  - c. Compatibility of the size of the firm with the size of the proposed project;
  - d. Past Performance working on City of Rockville task orders when prior work history is available, including Quality and Timeliness. (Lack of prior experience with City of Rockville is in no way considered a barrier to receiving an award);
  - e. Capacity to accomplish the proposed work in required time;
  - f. Insurance;
  - g. Financial Responsibility; and
  - h. Measures of protection for the State against errors and omissions.

\*Please Note: If an offeror receives a rating of "unacceptable" on three (3) of the rating criteria above, the offeror will not be further considered. The offerors' proposal will be rejected as "not susceptible of being selected for award." COMAR 21.06.02.03(2)



# City of Rockville

## Fleet and Monroe Streets, Complete Streets Study

PREPARED FOR THE CITY OF ROCKVILLE BY



FUNDED BY THE METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS  
TRANSPORTATION LAND-USE CONNECTIONS PROGRAM

June 2023



Fleet and Monroe Streets, Complete Streets Study



Table of Contents

INTRODUCTION ..... 2

    Project Need, Goals, And Objectives ..... 2

    Objective ..... 2

    Goals ..... 2

PROJECT INFLUENCES AND PRIOR PLANNING EFFORTS ..... 2

    Stakeholders ..... 3

CONCEPT DEVELOPMENT ..... 3

    Opportunities and Constraints ..... 3

    Design Process & Study Methodology ..... 3

    Field Observations: ..... 4

    Traffic Impacts of a 4-lane to 3 Lane Road Diet ..... 5

    Initial Concept Development and Stakeholder Discussion ..... 6

    Initial Stakeholder Comments ..... 10

    Finalized Concepts ..... 11

        Concept 1: Bike Path behind curb ..... 12

        Concept 2: Two-way inroad cycletrack ..... 15

IMPACTS ANALYSIS ..... 17

    Parking and traffic impacts ..... 17

    Construction Costs ..... 18

    Public Meeting ..... 18

DESIGN CONSIDERATIONS AND NEXT STEPS ..... 19

    Design Summary and Future Considerations ..... 19

    Preferred Option and Next Steps in the Design Process ..... 20

FUNDING OPPORTUNITIES ..... 21

Appendix A: Traffic counts

Appendix B: HCM Reports

Appendix C: Conceptual Plans

Appendix D: Cost Breakdown

Appendix E: Public Presentation

## Fleet and Monroe Streets, Complete Streets Study



## INTRODUCTION

The City of Rockville received funding through MWCOG's Transportation Land Use Connections (TLC) technical assistance program to study the feasibility and impacts of expanding dedicated and separated bike facilities out from the Town Center core, leveraging previous dedicated biking infrastructure to reach more destinations and amenities.

Dedicated biking facilities along Monroe Street and Fleet Street will extend planned bike lanes along East Middle Lane southward to the Rockville Metro Station pedestrian bridge, Richard Montgomery Highschool (and the shared used path that surrounds it), and to Maryland Ave and points south. When complete, these facilities will provide a comfortable and safe dedicated connection for cyclists and micromobility commuters, complementing the existing sidewalk and street grid, allowing residents and visitors convenient non-vehicular access to and throughout the Town Center.

### Project Need, Goals, And Objectives

The City of Rockville seeks to extend its biking infrastructure and to increase connectivity to the Rockville Metro Station, County office buildings and local schools. This feasibility study explores potential options for expanding dedicated bike facilities, separated from vehicle traffic, and analyze the impacts, benefits, and constructability of each.

### Objective

Connect under-construction bike lanes on Middle Lane to Fleet Street and Monroe Street via a dedicated and protected bike path or lanes that are separated from vehicular traffic.

### Goals

Primary goals for the proposed projects include:

- Increase recreational and commuting options to local destinations from residential neighborhoods.
- Reduce vehicle miles traveled in the Town Center.
- Connect existing biking infrastructure to provide Complete Streets throughout Rockville Town Center.
- Provide proof of concept design (e.g., no fatal flaws, minimized traffic impacts, constructable, etc.).

## PROJECT INFLUENCES AND PRIOR PLANNING EFFORTS

The desired alignment for dedicated bike facilities builds upon prior work by the City along East Middle Lane and along Washington Street. These plans are complete and were provided by the City as part of the prior planning efforts. For the purpose of developing conceptual alignments, these plans were incorporated into base mapping efforts as *existing conditions*.

To assist with the feasibility analysis, the City of Rockville provided signal timing for all locally-owned traffic signals as well as available traffic count data. Remaining signal timing was obtained from Montgomery County and additional traffic counts were collected in the Winter of 2022. Additional City directives that drove the conceptual designs include:



## Fleet and Monroe Streets, Complete Streets Study



- If proposing a road diet, keep general travel lanes at 11 feet width.
- Turn lanes can be 10 feet wide.
- Curbside *unprotected* bike lanes are undesirable.
- Mixing of pedestrians and cyclists on a shared use path is allowable, but separate pedestrian and bike facilities are desirable.
- City has previously been against 2-way cycletracks in the past.

### Stakeholders

While the City of Rockville is the project originator, other government representatives that are stakeholders include:

- City of Rockville Department of Public Works
- Rockville Bicycle Advisory Committee (RBAC) / Rockville Pedestrian Advocacy Committee (RPAC)
- Montgomery County Government offices
- Maryland Department of Transportation State Highway Administration (MDOT SHA)
  - Owner of MD 28 / Monroe Street intersection
- RideOn bus service

## CONCEPT DEVELOPMENT

### Opportunities and Constraints

Fleet Street and Monroe Street are both fully developed with office, commercial, and residential properties. Additionally, there is limited public right of way for constructing bike facilities behind existing curb and adjacent to existing sidewalk. Also, existing travel lanes are narrow (11 to 12 feet), limiting the ability to use extra space from wide travel lanes to construct on-street bike facilities. Finally, there is on-street curb side parking along Fleet Street and Monroe Street, the latter of which is often fully-occupied.

Despite, these constraints, there are opportunities to construct dedicated bike facilities, adjacent to existing sidewalks, within the public right-of-way. Primarily, both Fleet Street and Monroe Street have ample traffic capacity, such that there is a possibility to reduce the number of general travel lanes and repurposing them for other modes. Additionally, because the Rockville Town Center area is a grid-based network of roads, there is potential to shift turn movements – and therefore dedicated turn lanes – to other intersections where capacity allows it, which also can free of pavement for repurposing. Finally, by providing safe and convenient biking options, short term vehicle trips can now be made by biking, reducing vehicle traffic.

### Design Process & Study Methodology

Developing alternative concepts began with an extensive field review and CAD base mapping effort for the Fleet Street and Middle Lane corridors. County-level GIS data was supplemented with in-the-field data collection. The field survey allowed for verification of existing mapping libraries and to note any recent construction projects. It also allowed for determining potential construction impacts that can be significant cost drivers – such as utility pole relocation, inlet relocation, need for retaining structure, etc. The base mapping included all existing sidewalk, curb and gutter, utility poles, driveways, large trees, and two-foot contour lines. To this, all public right of way information and lot lines were added, in

## Fleet and Monroe Streets, Complete Streets Study



addition to pavement markings, street signs and dimensions. Concept designs were developed using the following design standards and guidelines:

- AASHTO
- NACTO
- PROWAG
- MUTCD
- ADAAG
- MDOT SHA
- Montgomery County DOT Standards

### Field Observations:

Field observations were conducted in early December 2022. The following observations were made:

#### *AM Peak Hour Observations:*

- Monroe St is generally low volume with moderate to high bus traffic.
- Several school age pedestrians and cyclists observed crossing Jefferson Street to Richard Montgomery High School.
- Monroe St at Jefferson St approximate average queue lengths noted were:
  - Eastbound left lane: 2 cars
  - Eastbound through lanes: 7 cars
  - Westbound lanes: 9 cars
  - Northbound lane: 2 cars
  - Southbound lane: 2 cars
- Monroe St at Middle Ln
  - Northbound queues are typically less than 2 vehicles.
  - A school bus was observed making an eastbound right onto Monroe St southbound.
- Monroe St at Montgomery Ave
  - Minimal queues observed on all approaches.
- Monroe Pl at Monroe St
  - Minimal queues observed on all approaches.
  - Monroe Pl is the nearest available EBL turn to MD 355 NB
- Monroe St at Fleet St
  - Queues on all approaches are less than 5 vehicles.

#### *PM Peak Period Observations:*

- Monroe St is generally low volume with moderate to high bus traffic.
- Many peds were observed crossing mid-block west of Monroe St from courthouse to parking garage.
- Monroe St at Jefferson St:
  - Inside north-south through lanes act as de facto left turn lanes.
  - 90% of eastbound left-turning traffic turn makes a northbound right turn at Monroe Pl toward MD 355

## Fleet and Monroe Streets, Complete Streets Study



- Buses observed making eastbound left and encroaching on through lane due to narrow lane width.
- Average queue lengths are:
  - Eastbound left lane: 1 car
  - Eastbound through lanes: 7 cars
  - Westbound lanes: 7 cars
  - Northbound lanes: 3 cars
  - Southbound lanes: 1 car
- Northbound queues increased to about 10 vehicles around 5:30PM when the Jury parking lot dismissed; however, queues were primarily in the outer northbound travel lane.
- Jury parking lot queue was extensive (over 30 vehicle long) when drivers were leaving at once.
- No cycle failure observed at intersection.
- Monroe St at Middle Ln
  - EB queues occasionally spill beyond Monroe St intersection from downstream signal at MD 355
  - NB queues less than 3 vehicles
  - Observed several mid-block U-turns from northbound.
- Monroe St at Montgomery Ave
  - Minimal queues less than 3 vehicles on any approach
- Monroe Pl at Monroe St
  - Minimal queues less than 3 vehicles on any approach
  - Monroe Pl is the nearest available eastbound left turn to MD 355 northbound.
- Monroe St at Fleet St
  - Southbound queues less than 5 vehicles maximum

Initial opportunities based on traffic observations include:

### **Alternative design ideas based on field observations.**

- Consider one-way operations on Monroe St from Middle Ln to Monroe Pl
  - Alternatively, remove parking and curb extensions on west side.
- Consider a road diet on Monroe St from Monroe Pl to Fleet St
  - Reduce four lane section to a three-lane section with a two-way center turn lane.
- Fleet St from Monroe St to MD Ave
  - Reduce four lane section to a three lane section with a two-way center turn lane.

### **Traffic Impacts of a 4-lane to 3 Lane Road Diet**

Based on the observations of peak period traffic and the potential for a road diet, a traffic analysis was performed to determine if, in fact, a conversion of Fleet and Monroe Streets from four lanes to three lanes was feasible and what the overall impacts were.

The City of Rockville provided counts at: Fleet St at Monroe St and Fleet St at Maryland Ave. These were supplemented by new counts conducted in late Fall of 2022 at: MD 355 at MD 28; MD 28 (Jefferson St) at Monroe St; and Monroe St at East Middle Lane. Traffic signal timing were obtained from the City and

## Fleet and Monroe Streets, Complete Streets Study



Montgomery County for all relevant signals. Both the signal timing and traffic volumes were used to develop a traffic model of the *existing conditions* traffic network in Synchro™ modeling software – an industry standard software used by local jurisdictions to time traffic signals and analyze traffic impacts. Standard measures of effectiveness of traffic modeling include: average vehicle delay, volume-to-capacity ratio (V/C), level of service (LOS), and vehicle queue lengths, and are generally developed for both an AM and a PM peak commuting hour. The existing conditions traffic model was validated based on field observations, allowing it to be modified to reflect real-world impacts of geometric changes, such as replacing a travel lane. Traffic counts can be found in Appendix A. The high-level results of the road diet analysis are summarized in Table 1.

Table 1: Intersection capacity analysis results between existing conditions and proposed concepts

| ID | Intersection                 | Approach     | Existing       |       |             | Build - Shared Use Path |       |             | Build - Exclusive Phase Opt 1 |       |             | Build - Exclusive Phase Opt 2 |       |             |
|----|------------------------------|--------------|----------------|-------|-------------|-------------------------|-------|-------------|-------------------------------|-------|-------------|-------------------------------|-------|-------------|
|    |                              |              | Delay          | LOS   | V/C         | Delay                   | LOS   | V/C         | Delay                         | LOS   | V/C         | Delay                         | LOS   | V/C         |
| 1  | Monroe St & E Middle Ln      | Control Type | Stop (2 - Way) |       |             | Stop (2 - Way)          |       |             | Stop (2 - Way)                |       |             | Stop (2 - Way)                |       |             |
|    |                              | Overall      | 0.0 (0.0)      | A (A) | 0.10 (0.20) | 0.0 (0.0)               | A (A) | 0.10 (0.20) | 0.0 (0.0)                     | A (A) | 0.10 (0.20) | 0.0 (0.0)                     | A (A) | 0.10 (0.20) |
| 2  | Monroe St & E Montgomery Ave | Control Type | Stop (All-Way) |       |             | Stop (All-Way)          |       |             | Stop (All-Way)                |       |             | Stop (All-Way)                |       |             |
|    |                              | Overall      | 0.0 (0.0)      | A (A) | 0.00 (0.00) | 0.0 (0.0)               | A (A) | 0.00 (0.00) | 0.0 (0.0)                     | A (A) | 0.00 (0.00) | 0.0 (0.0)                     | A (A) | 0.00 (0.00) |
| 3  | Monroe St & Monroe Pl        | Control Type | Stop (All-Way) |       |             | Stop (All-Way)          |       |             | Stop (All-Way)                |       |             | Stop (All-Way)                |       |             |
|    |                              | Overall      | 0.0 (0.0)      | A (A) | 0.00 (0.00) | 0.0 (0.0)               | A (A) | 0.00 (0.00) | 0.0 (0.0)                     | A (A) | 0.00 (0.00) | 0.0 (0.0)                     | A (A) | 0.00 (0.00) |
| 4  | Monroe St & E Jefferson St   | Control Type | Signal         |       |             | Signal                  |       |             | Signal                        |       |             | Signal                        |       |             |
|    |                              | Overall      | 17.9 (23.9)    | B (C) | 0.48 (0.55) | 18.1 (24.9)             | B (C) | 0.50 (0.61) | 29.3 (52.2)                   | C (D) | 0.52 (0.64) | 24.3 (33.2)                   | C (C) | 0.51 (0.64) |
| 5  | Monroe St & Fleet St         | Control Type | Signal         |       |             | Signal                  |       |             | Signal                        |       |             | Signal                        |       |             |
|    |                              | Overall      | 13.1 (10.1)    | B (B) | 0.59 (0.48) | 17.2 (16.1)             | B (B) | 0.59 (0.54) | 17.2 (16.1)                   | B (B) | 0.59 (0.54) | 14.6 (17.6)                   | B (B) | 0.56 (0.56) |
| 6  | Maryland Ave & Fleet St      | Control Type | Signal         |       |             | Signal                  |       |             | Signal                        |       |             | Signal                        |       |             |
|    |                              | Overall      | 29.3 (79.8)    | C (E) | 0.67 (0.88) | 29.3 (81.2)             | C (F) | 0.67 (0.88) | 29.3 (81.2)                   | C (F) | 0.67 (0.88) | 31.2 (82.1)                   | C (F) | 0.67 (0.88) |
| 7  | MD 355 & E Jefferson St      | Control Type | Signal         |       |             | Signal                  |       |             | Signal                        |       |             | Signal                        |       |             |
|    |                              | Overall      | 46.2 (69.0)    | D (E) | 0.67 (0.78) | 46.2 (68.6)             | D (E) | 0.67 (0.78) | 46.2 (68.6)                   | D (E) | 0.67 (0.78) | 46.2 (68.6)                   | D (E) | 0.67 (0.78) |

Several assumptions were made in this initial traffic analysis, because there are additional signal modifications needed, depending on the type of facility created for cyclists. Specifically, in addition the existing conditions model, a shared-use path for cyclists and scooters (adjacent to sidewalk) could have different signal phasing requirements than an *on-street* two-way cycletrack. Accordingly, the 4 scenarios in Table 1 reflect the following assumptions:

1. Existing conditions
2. Side Path behind a new curb line, adjacent to sidewalk
3. On-street cycletrack that would require exclusive WALK phasing for cyclists crossing Jefferson St.
4. On-street cycletrack that would require a protected WALK phase for cyclists crossing Jefferson St. while prohibiting northbound left turn across the cycletrack but permitting all other northbound vehicle movements simultaneously with the WALK phase. Additionally, this option also assumes a short turn pocket for NBL on Monroe St at Fleet St.

These options will be discussed in further detail in the *Impacts* section.

HCM and queuing reports for each option can be found in [Appendix B](#).

### Initial Concept Development and Stakeholder Discussion

The following concepts present alignment options discussed with City Staff and stakeholders:

- Bike/scooter raised path (behind a curb) along the south side of Fleet Street and the west side of Monroe Street.
- In-road two-way cycletrack along the south side of Fleet Street and the west side of Monroe Street.



Fleet and Monroe Streets, Complete Streets Study



Figure 1 and Figure 2 show the existing and proposed typical sections for each concept.

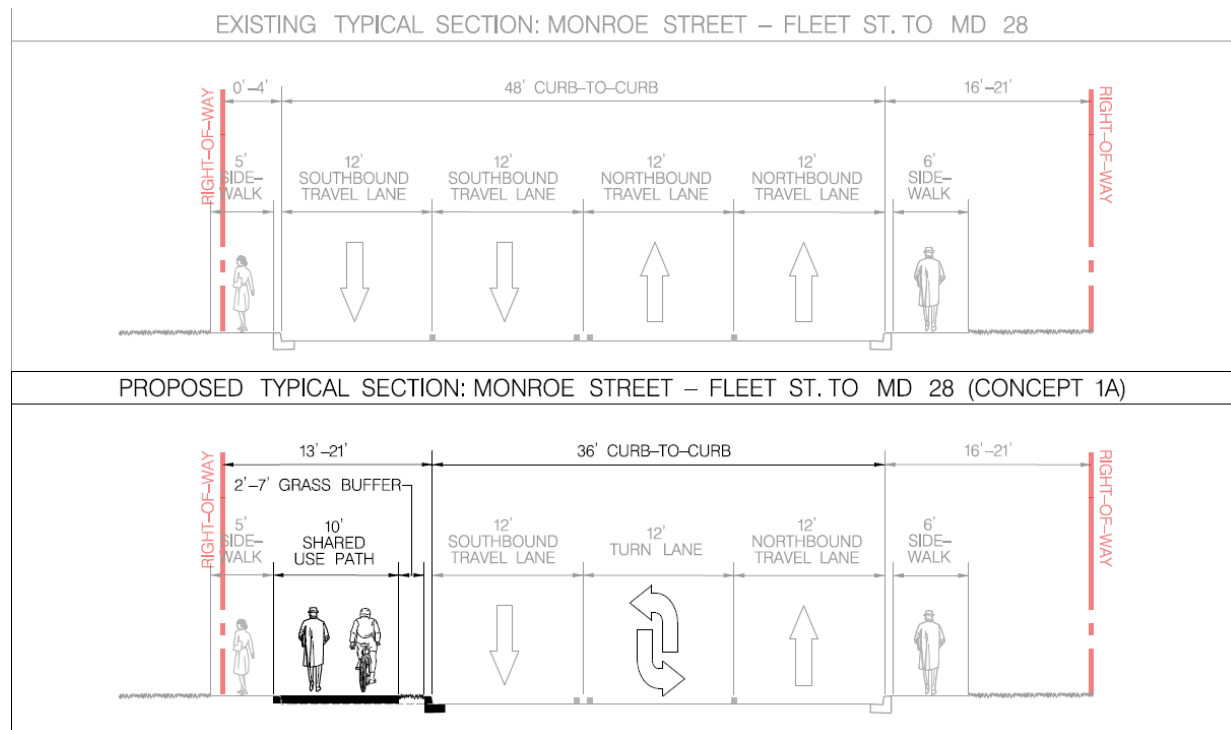


Figure 1: Existing and proposed typical cross section for raised bike path option.

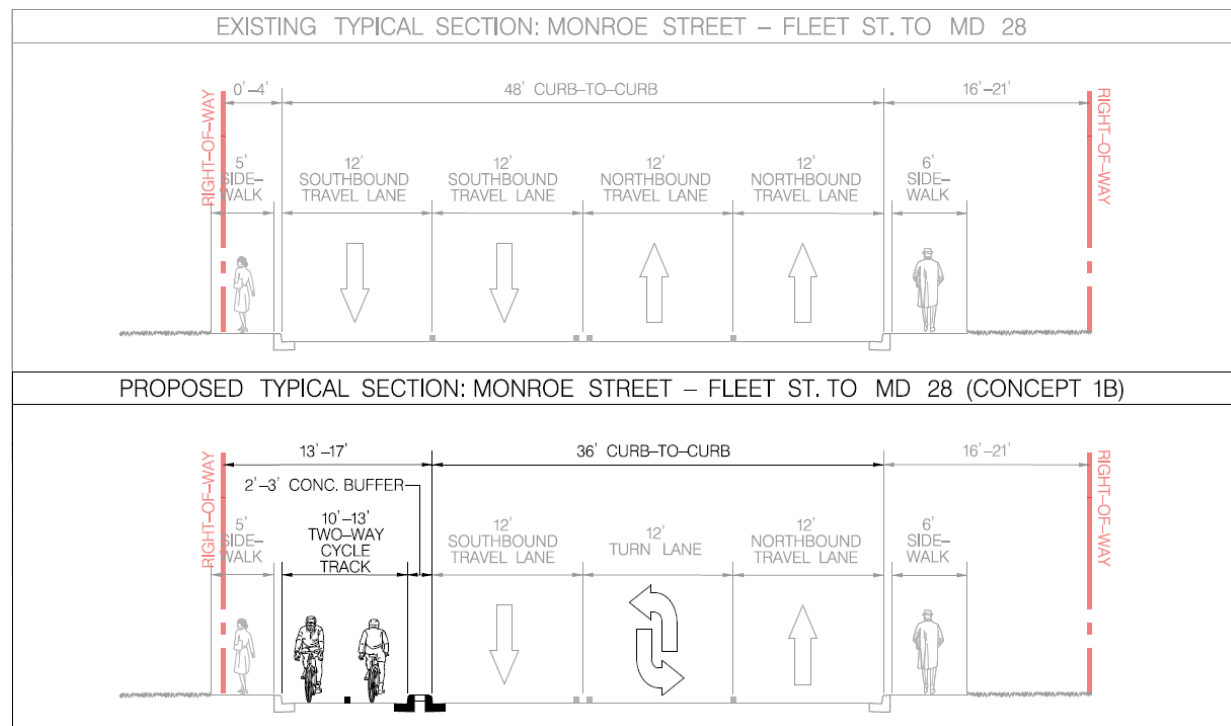


Figure 2: Existing and proposed typical section for on-street two-way cycle track option.

ATTACHMENT A

Fleet and Monroe Streets, Complete Streets Study



Both of these typical sections represent generally the same idea of removing a general purpose travel lane and dedicating it for bike infrastructure, leaving existing sidewalk in place. Additionally, both options propose reducing Monroe Street to one-way northbound only from Montgomery Ave to East Middle Lane. However, each option has different impacts with regard to intersection treatments. Both the raised bike path and the two-way cycletrack were conceptually drawn in plan-view for a preliminary discussion with the City of Rockville and MDOT SHA. Additionally, these concepts were discussed with MC-DOT, particularly with regard to bus stop treatments for the County's RideOn bus service, which has multiple stops along the Fleet Street and Monroe Street. An example of the preliminary conceptual layouts discussed with City, County, and State stakeholders is shown below:

- Example of raised path on Fleet Street (Figure 3)
- Example of two-way cycle track on Fleet Street (Figure 4)
- Example of one-way traffic operations on Monroe Street from Montgomery Ave to East Middle Lane (Figure 5)

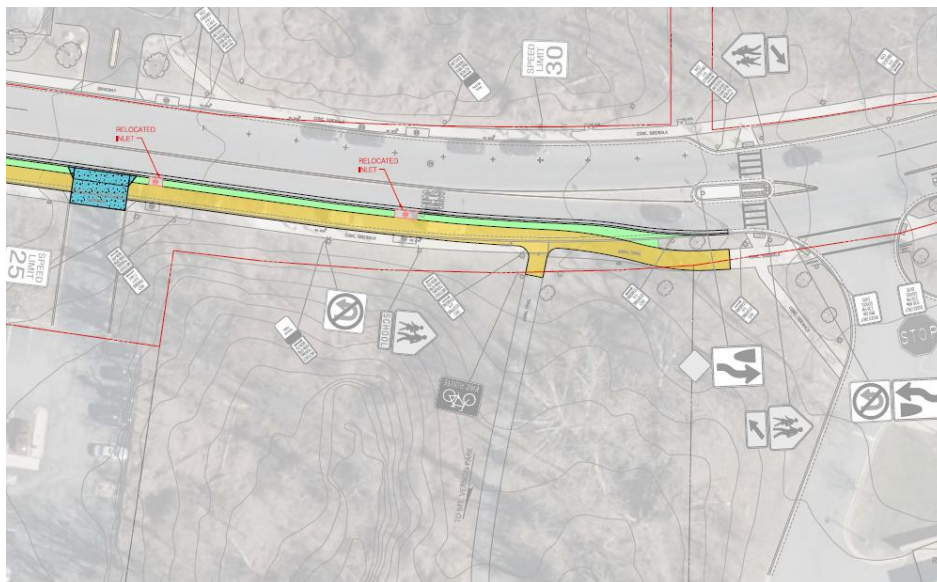


Figure 3: Example of a raised path concept on Fleet Street

Fleet and Monroe Streets, Complete Streets Study

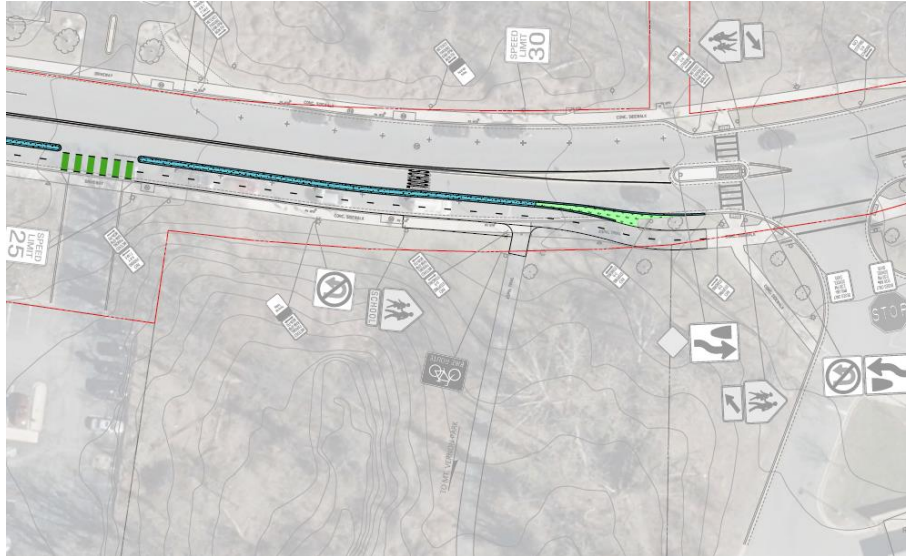


Figure 4: Example of a two-way cycletrack concept on Fleet Street

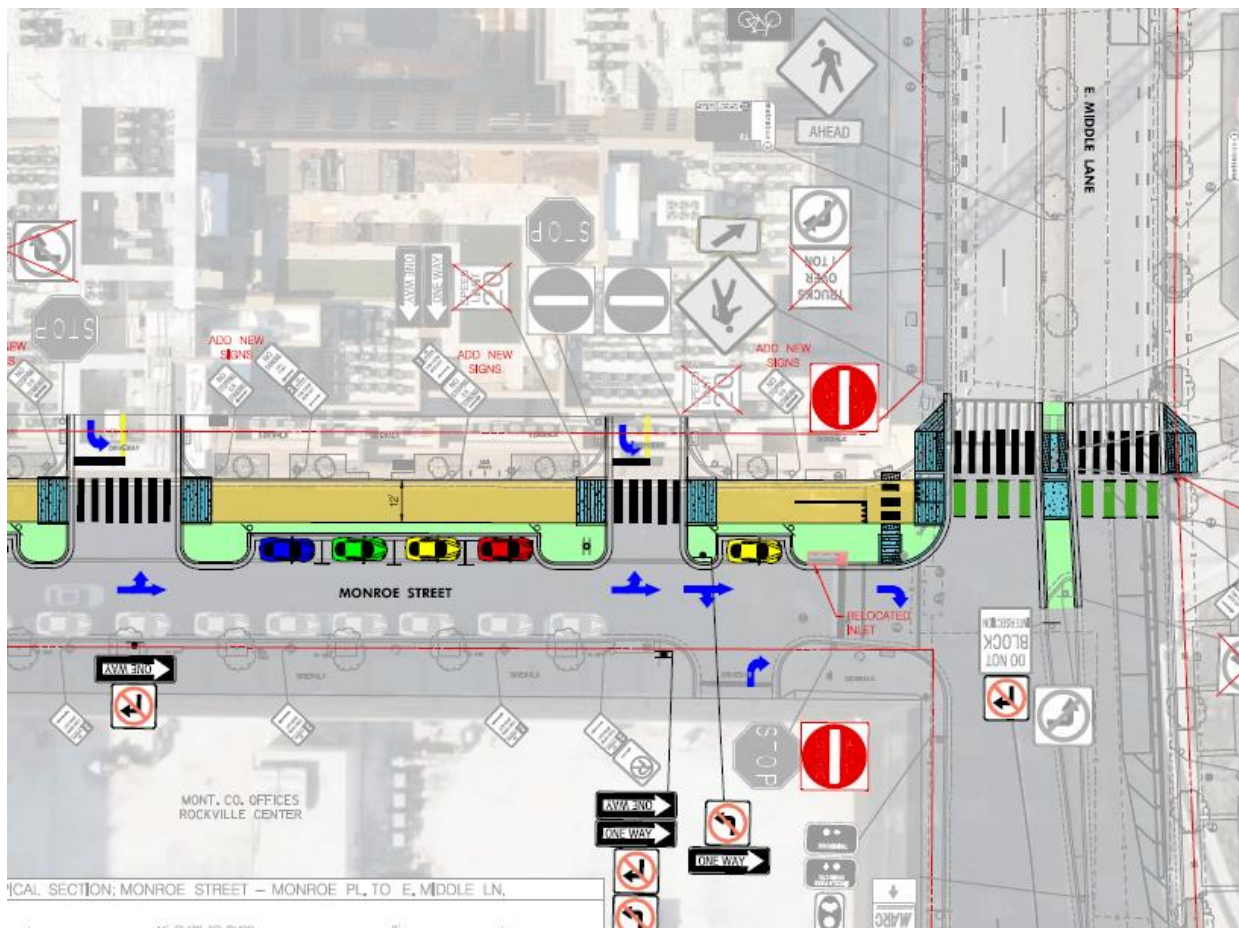


Figure 5: Example of a one way operations on Monroe Street, south of East Middle Lane

## Fleet and Monroe Streets, Complete Streets Study



### Initial Stakeholder Comments

The following is a summary of all concept comments and how they are addressed – either in this current preliminary design phase or the next design phase (30% Design). Solutions/next steps related to the refinements of the concepts *are in italics*.

- Maintain consistency with crosswalks bikewalks. Provide continental-style crosswalks only (global comment). MDOT SHA prefers green ladder style for bike crosswalks.
  - *All crosswalks will be shown as continental style.*
- Add transit crossings at all bus stops.
  - *Per discussions with MCDOT, all transit crossings will have wide crosswalks to accommodate both doors of a bus, and the crossings will be at grade with the bus stop.*
- If the bike path option is selected, then existing APS/CPS needs to be relocated. Also, crossing any ADA ramps should get you immediately to pedestrian facility – not into the path of a cyclist.
  - *If bike path option is selected, design will reflect ADA detectable warning surface between path and existing sidewalk.*
- May need to evaluate impacts of local apartments that have driveways onto Monroe Street, if the latter is turned into one-way northbound.
  - *Traffic along southbound Monroe Street is low, ~100 cars per day. Additionally adjacent apartments have garages with exits onto parallel roads (e.g., Helen Heneghan Way)*
- Ensure that northbound Monroe street at Middle Lane only allows right turns only.
  - *Northbound left turns and through movements are proposed to be eliminated by continuing the median along Middle Lane through the intersection, such that only right turns are feasible.*
- Consider how to terminate facilities, so that they integrate into future bike lanes on Middle Lane.
  - *Bike path or lane will have separate green bike crosswalk. Additionally, median break at Middle Lane is proposed to be closed.*
- Ensure no ADA warning surfaces on the bike path – only for shared-use bike/pedestrian paths.
  - *ADA warning surfaces along bike path are removed from concepts.*
- If the cycletrack option is selected, refer to Montgomery County's draft guidelines for floating bus stops.
  - *Concepts will reflect these guidelines.*
- Include a conceptual option for parking removal along Monroe Street – between Middle Lane and Montgomery Ave – to retain two-way traffic.
  - *Optional concept is included.*
- General question regarding how to tell cyclists when it is okay to cross signalized intersections. When should cyclist movements be protected from all/some vehicle turn movements? MDOT SHA has guidance for protection of cycletracks across State-owned intersections.
  - *For both options, the intersection of Fleet St at Monroe is designed as a protected intersection, with cyclists crossing with the WALK indication. The facility type selected will determine the type of crossing protection given to cyclists for crossing the MD 28 intersection. For a bike only path adjacent to the sidewalk and behind a curb, MDOT SHA may allow a similar crossing indication, where cyclists cross with the WALK phase (concurrent with northbound and southbound green vehicle green phases), assuming*



## Fleet and Monroe Streets, Complete Streets Study



*that cyclist speed can be reduced at the intersection. For the cycletrack option, MDOT SHA only allows a dedicated WALK phase, meaning that while pedestrians can cross concurrently with cyclists, northbound and southbound vehicle traffic must be prohibited from crossing the cycletrack, i.e., only northbound through movements or right turns are allowed and southbound through movements and left turns are allowed.*

- Street lighting along both Monroe Street and Fleet Street needs to be improved. It is too dark for pedestrians during the nighttime.
  - *Comment noted. Additional lighting will be evaluated during future design phases.*

### Finalized Concepts

The following section describes each of the two potential concepts and provides an analysis of impacts and overall construction feasibility. Impact analysis generally relates to cost, permitting needs, right of way acquisition, utility relocations, as well as any parking loss. A conceptual design plan for each project is presented in [Appendix C](#). As shown in Figure 6, the limits of the proposed bike facilities are:

- West Side of Monroe Street, joining proposed bike lanes on Middle Lane in the north to Fleet Street in the South.
- South side of Fleet Street, joining Maryland Ave to the existing shared use path at Richard Montgomery High School

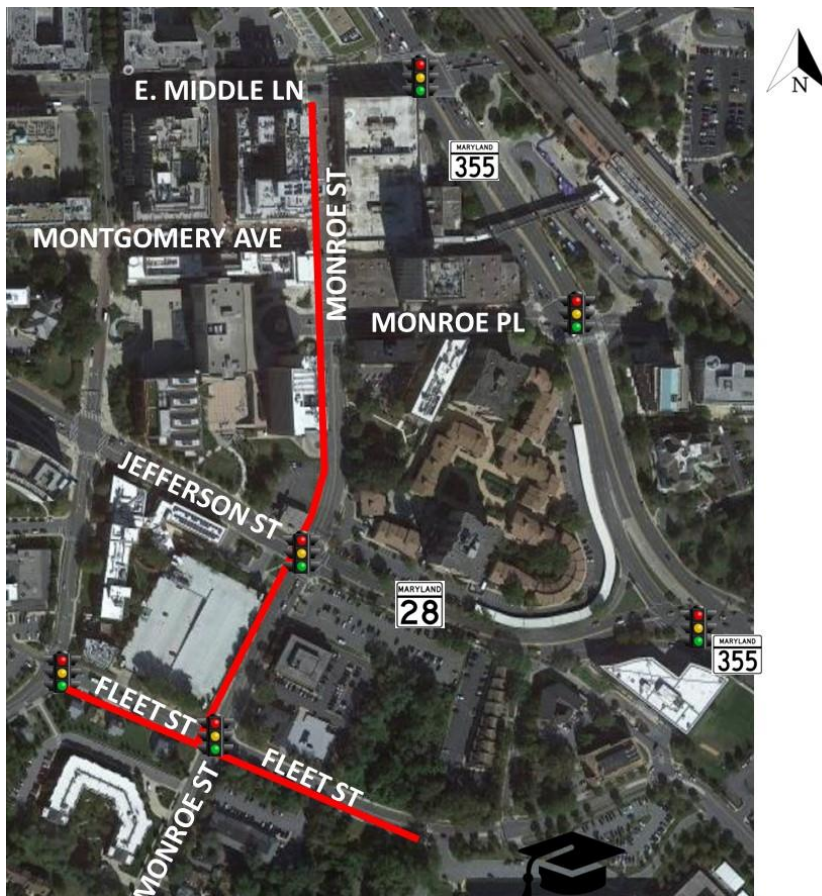


Figure 6: Bike facility project limits and location

ATTACHMENT A

Fleet and Monroe Streets, Complete Streets Study



*Concept 1: Bike Path behind curb*

As shown in Figure 7, the bike path begins in the west at the southeast quadrant of Maryland Ave at Fleet Street, where the current sidewalk landing will be widened to a shared bike/pedestrian landing, before the sidewalk and bike path split.

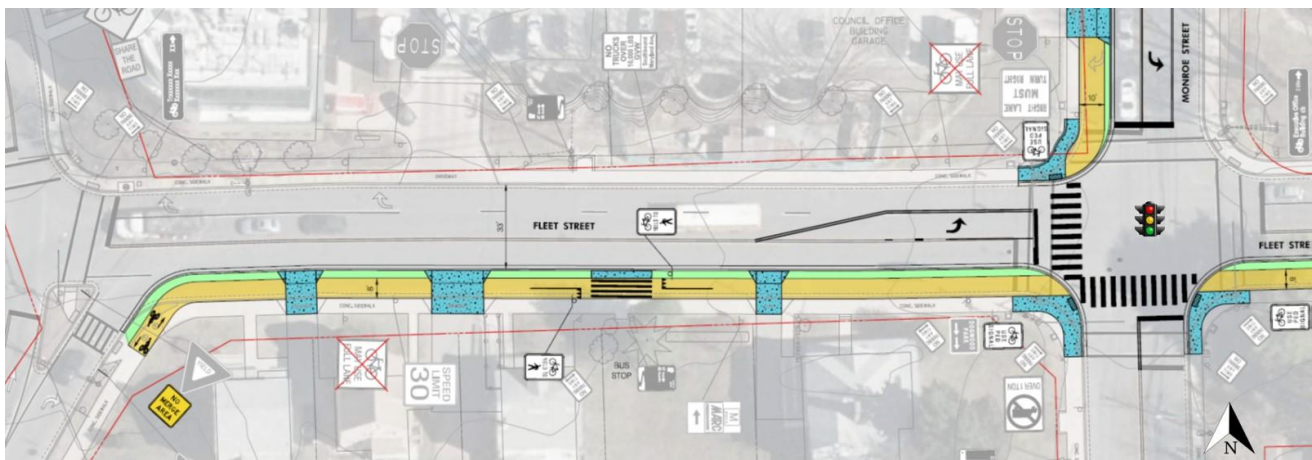


Figure 7: West terminus of bike path option

The path, along with a buffer from the roadway, replaces the outside eastbound travel lane of Fleet Street. The path crosses three existing residential driveways, whose aprons will have to be reconstructed. Additionally, the path crosses a transit stop; as shown in Figure 7, a wide crosswalk is provided across the path, to which cyclists must yield when bus riders board or alight. Additionally, the bike path and sidewalk utilize the same crosswalks at the intersection of Fleet St at Monroe St, both modes crossing with the WALK signal. Of note, the southbound bike path bends toward the west, as it approaches Fleet Street, which forces cyclists to slow down at the crossing and also places them more into drivers' cones of vision, as they turn into the crosswalk from the north or south. Finally, the westbound left turn lane (at Maryland Ave) is shown as substantially longer than the eastbound turn lane at Monroe Street; this is due to the much larger left turn volume onto southbound Maryland Ave, when compared to the left turn volume onto northbound Monroe Street.

Figure 8 shows the eastern terminus of the separated bike path. The path meanders south, just prior to the midblock crossing at the RMHS entrance, where it ties into the existing sidewalk and ultimately the existing side use path in front of the school. Of note, existing curbside inlets will have to be relocated to the new curb line.

## Fleet and Monroe Streets, Complete Streets Study

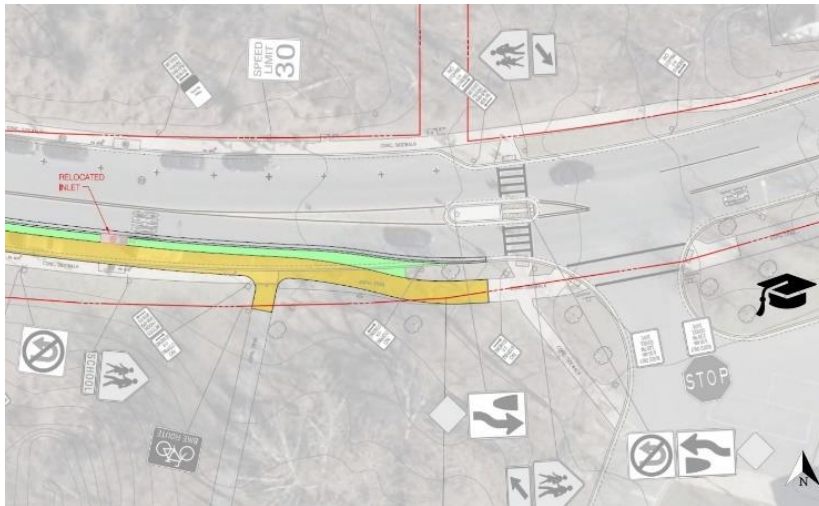


Figure 8: Eastern terminus of proposed bike path at RMHS

Additionally, this segment of Fleet Street has 7 metered curbside spaces along the south side of the road that will be eliminated with this design.

Figure 9 shows the bike path option crossing Jefferson street (MD 28). At this intersection, Monroe Street has somewhat wider lanes that allow the bike path to have ample buffer from the roadway, which pushes the shared use crosswalk (both for pedestrians and cyclists) back from the road edge. This allows for turning vehicles to have more opportunity to see fast moving cyclists through the crosswalk, who use the WALK phase, like pedestrians. In addition to the curb being relocated, this concept reconfigures the driveway apron for the County parking garage and the pedestrian ramps for crossing Jefferson Street.

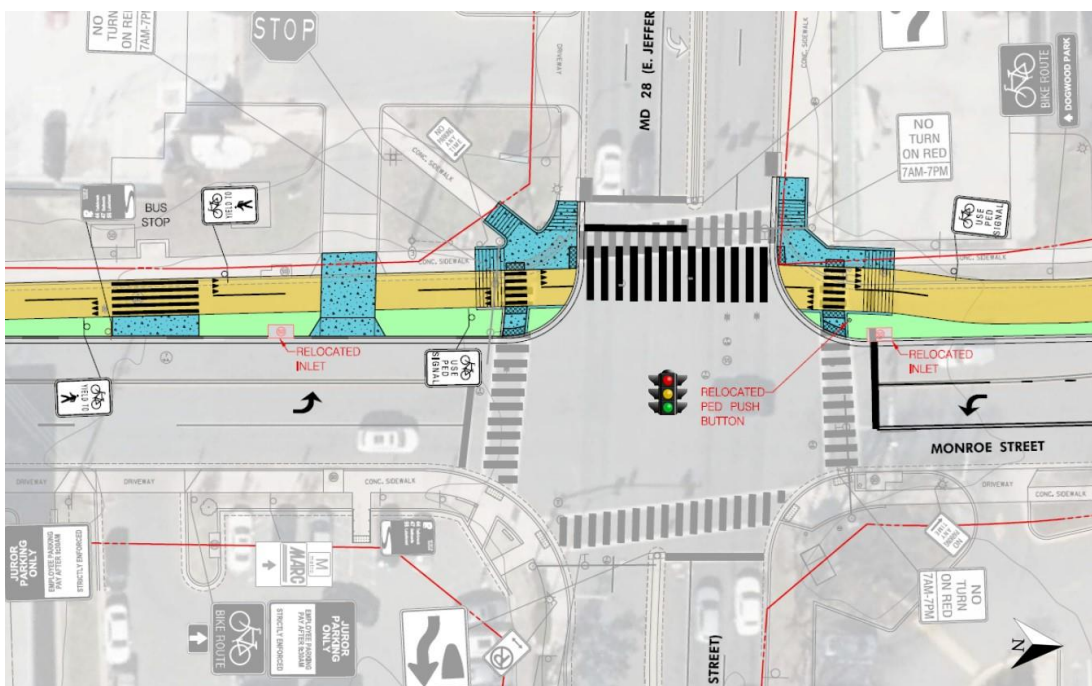


Figure 9: Bike path option, crossing Jefferson Street



## Fleet and Monroe Streets, Complete Streets Study



As on Fleet street, the bus stop remains at grade through the path. Northbound and southbound left turn lanes on Monroe Street remain in this option.

As the bike path terminates in the north at East Middle Lane, there is limited opportunity to install a bike path, while also retaining curbside parking on both sides of Monroe Street and two travel lanes. Accordingly, the proposed concept eliminates the southbound travel lane, turning Monroe Street into one-way northbound from Montgomery Ave to East Middle Lane, as shown in Figure 10.

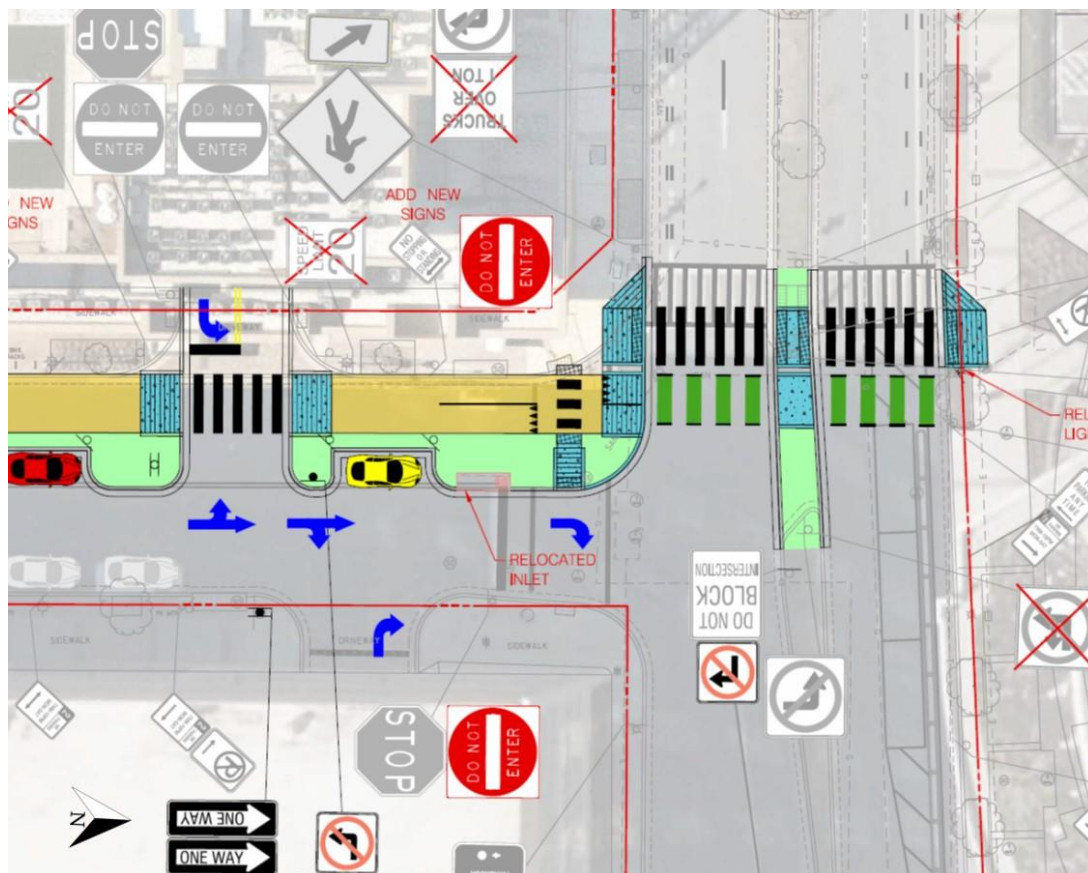


Figure 10: Bike path concept, northern terminus and crossing at East Middle Lane

This design retains all existing curbside parking. This block of Monroe Street sees only about 1000 vehicles per day, with a 90%/10% northbound/southbound split. It is reasonable to expect that those 100 daily southbound trips can be absorbed into the City's grid network with minimal impacts. Additionally, the bike path terminates with a green bike crosswalk that connects it to the pending bike lanes on East Middle Lane. Finally, the existing median is proposed to be closed, since westbound lefts and northbound lefts through the median opening are already prohibited.



# Fleet and Monroe Streets, Complete Streets Study



## Concept 2: Two-way inroad cycletrack

As shown in Figure 11, the cycletrack option begins in the west, similar to the bike path option with a shared pedestrian/bike landing area off of Maryland Ave. The on-road two-way cycletrack option replaces the outside eastbound travel lane with a 9-foot two-way bike facility and 3-foot buffer shown as pre-cast concrete curbs.

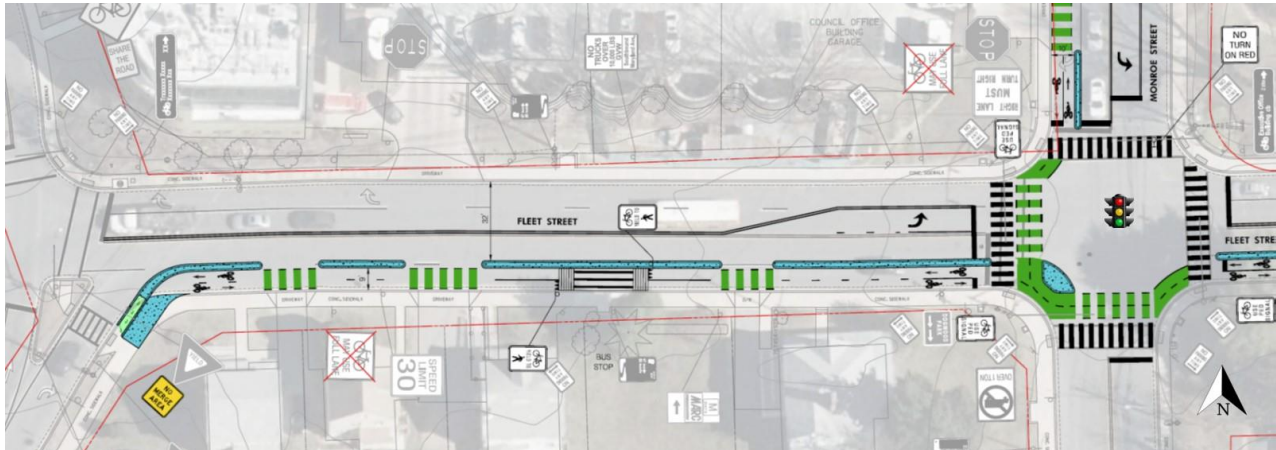


Figure 11: West terminus of cycletrack option

Because the cycletrack is at the same grade as the roadway, the bus stop crossing is shown as a raised ramp through the cycletrack, and a crosswalk is shown to allow ADA-compliant crossing for transit users. A partially-protected intersection is proposed at the intersection of Fleet Street and Monroe Street, where cyclists would cross with pedestrians using the WALK phase. The bike crosswalks are situated to maximize the visibility of cyclists in the crosswalk by right- and left-turning drivers. Similar to the bike path, the southbound bike lanes along Monroe Street bend away from the intersection on the approach to Fleet Street, in order to increase the visibility of cyclists to turning motorists. Generally, the turn volumes in the peak hours are low, such that protected-only bike movements through the intersection are not necessary.

As shown in Figure 12, the cycletrack terminates at RMHS, where it merges with the existing sidewalk and connects to the existing shared use path by the midblock crossing.

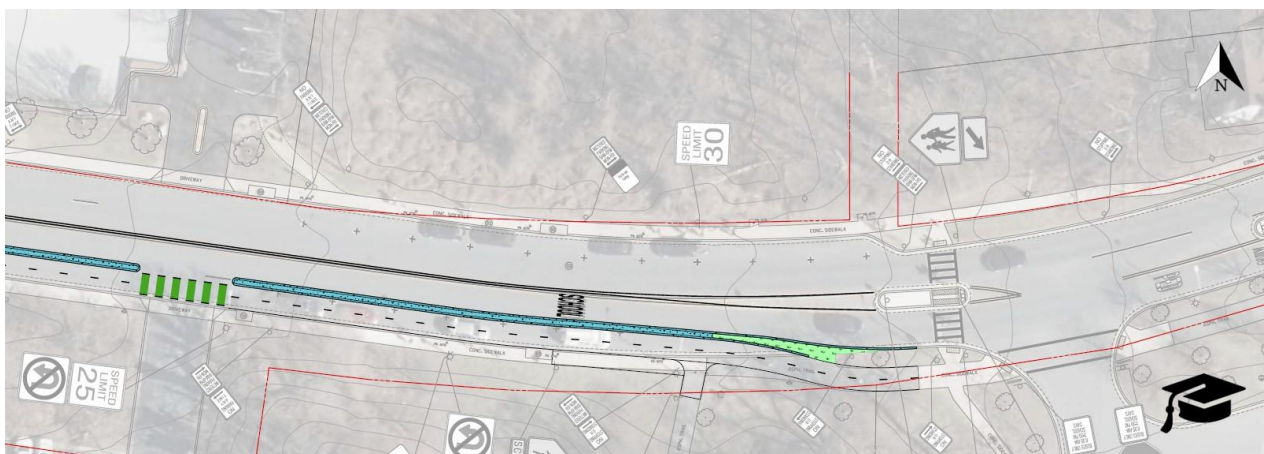


Figure 12: Eastern terminus of proposed cycletrack at RMHS



As shown in Figure 13, the two-way cycletrack along Monroe Street crosses MD 28 (Jefferson Street) in a separate crosswalk from pedestrians. Per MDOT SHA policy, two-way cycletracks must have dedicated (but not necessarily exclusive) phasing similar to the WALK phase for pedestrians. The WALK phase can be concurrent for both walkers and cyclists and must meet the minimum bike clearance time (similar to the flashing DON'T WALK phase for pedestrians). No other turn movements across the cycletrack are permitted during the WALK phase for the bikes. Accordingly, there are several timing options available:

- Pedestrians and cyclists receive concurrent WALK phase, and all vehicle traffic is given a red light.
- Other vehicle movements can be allowed to maximize the efficiency of the intersection, when the WALK phase is provided, and no bikes are present:
  - Optionally, the southbound left turn lane of Monroe can be provided a green arrow.
  - Optionally, the northbound left turn can be given a red arrow, while the northbound through/right lane is provided a green phase.
  - The left turns can be prohibited, and the left turn lane becomes a through lane and the outside northbound lane becomes a right only lane (note, this will require altering the lane widths to ensure that the lateral shift of northbound traffic through the intersection is minimized).

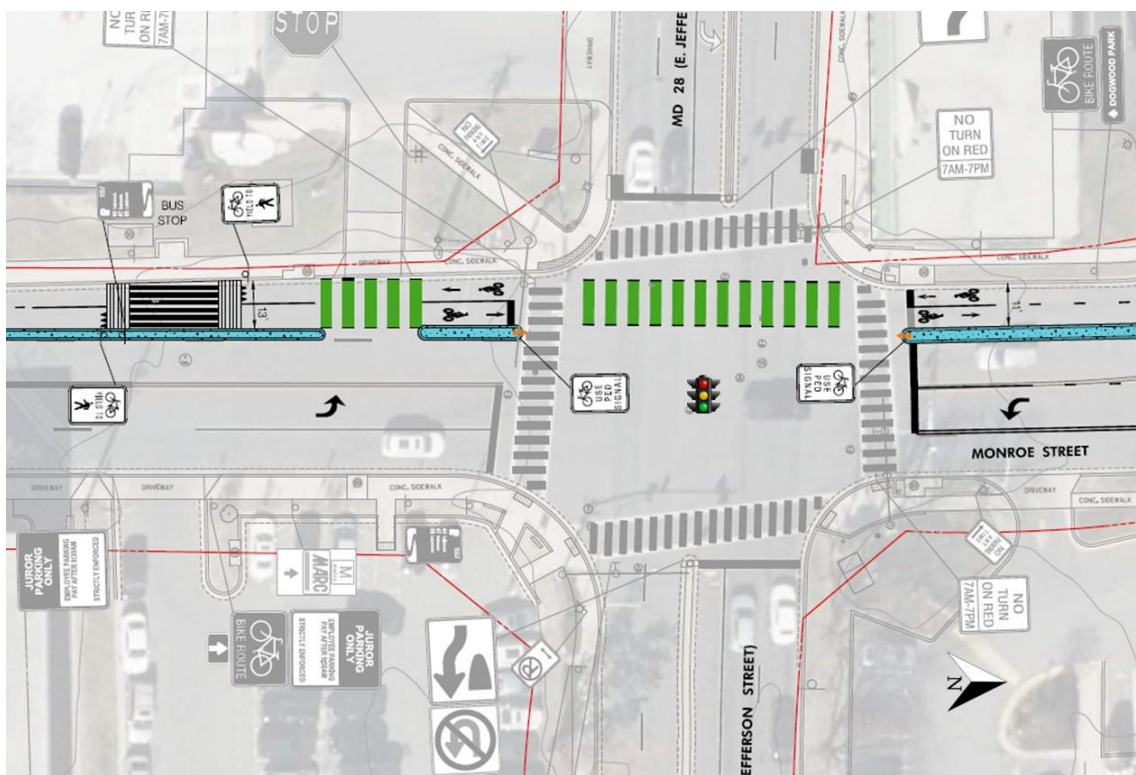


Figure 13: cycletrack concept crossing MD 28 (Jefferson Street)

## Fleet and Monroe Streets, Complete Streets Study



A final option is for the WALK phase for bikers and pedestrians to be activated only, such that users need to request the WALK phase via a pedestrian push button. It should be noted that Rockville is moving away from these type of activated WALK phases – particularly in the Town Center area.

North of Monroe Place, the proposed cycletrack transitions to an off-road bike path, identical to the first option discussed – as shown previously in Figure 10. This transition from on-road to off-road occurs due to Monroe Street road width narrowing and bumpouts, north of Monroe Place.

Appendix C contains the full conceptual drawing set for the on-road cycletrack option.

## IMPACTS ANALYSIS

Table 2 shows the estimated impacts as well as construction quantities for each of the two concepts. An impact analysis was also conducted on additional concept that represented a combination of the first two, where a cycletrack is proposed for Fleet Street, where bike/pedestrian activity is lower than the Town Center core, and an off-road bike path on Monroe Street, where pedestrian and bike activity is greater and off-road non-vehicle facilities are more amenable and familiar to drivers.

*Table 2: Estimated Impacts and Quantities for off-road bike path and on-road cycletrack options*

| Metric                        | Cycletrack                    | Side Path                          | Combination (cycletrack only on Fleet) |
|-------------------------------|-------------------------------|------------------------------------|----------------------------------------|
| LOD (sf)                      | 7,500                         | 34,500                             | 22,000                                 |
| Impervious area change (sf)   | 500 reduction                 | 2500-3000 reduction                | 2000-2500 reduction                    |
| Inlets relocated              | 2                             | 8                                  | 6                                      |
| Utility/light poles relocated | 2                             | 2                                  | 2                                      |
| Driveways reconstructed       | 0                             | 9                                  | 5                                      |
| parking spaces lost           | 0 or 4 on Middle & 7 on Fleet | 0 or 4 on Middle & 7 on Fleet      | 0 or 4 on Middle & 7 on Fleet          |
| Change in traffic LOS         | LOS is unchanged              | LOS is unchanged                   | LOS is unchanged                       |
| Bike Level of Stress          | LTS 1                         | LTS 1                              | LTS 1                                  |
| Estimated Cost                | \$400,000                     | \$1,000,000                        | \$760,000                              |
| Other Notes                   | lowest cost                   | SUP more commonplace; highest cost | Removes need for bike phases           |

As shown in the table above, the Limits of Disturbance (LOD) is highest for the off-street bike path; the LOD impacts the size of the stormwater management mitigation needed to serve the project. However, both concepts, as well as the combination of the two described earlier, have a net reduction in overall impervious pavement, due largely to each concept replacing an existing asphalt travel lane.

### Parking and traffic impacts

All concepts will remove 7 paid meter spaces along the south side of Fleet Street. Depending on the alternative chosen, there can as little as zero spaces lost on Monroe Street if it is converted to one-way

## Fleet and Monroe Streets, Complete Streets Study



operations north of Monroe Place. If two-lane operations are to remain for this segment, then 4 southbound curbside spaces would be removed between Monroe Place and Montgomery Ave, and 5 southbound curbside spaces would be removed between Montgomery Ave and Middle Lane.

Traffic impacts are minimal, due to the excess roadway capacity on Fleet Street and Monroe Street. The overall LOS for each intersection would remain unchanged – even before accounting for any signal timing changes that would likely occur with a road diet. As shown in Table 3, the bike path has no impact on the intersection LOS for each study area intersection.<sup>1</sup> Also, note that in the PM peak hour, the intersection of MD 28 (Jefferson St) at Monroe place degrades from a C to a D. This degradation happens under the assumption that the WALK phase for bikes is an exclusive phase, with no other vehicles permitted to enter the intersection. Since this is not a specific requirement, per MDOT SHA, a traffic analysis shows that (in the last column of Table 3) the intersection has no changes in LOS, under the assumption that all northbound Monroe Street traffic through the intersection is permitted and that left turn traffic is prohibited. Other similar traffic assumptions would yield similar results, such as permitting southbound left turns and providing northbound traffic with a green light, while providing northbound left turns with a red arrow.

Table 3: Intersection-level traffic impact summary, LOS AM (PM)

| Intersection                 | Existing Conditions | Bike Path | 2-way Cycletrack with Exclusive WALK across MD 28 | 2-way Cycletrack with concurrent northbound traffic at MD 28 |
|------------------------------|---------------------|-----------|---------------------------------------------------|--------------------------------------------------------------|
| Monroe St & E Middle Ln      | A (A)               | A (A)     | A (A)                                             | A (A)                                                        |
| Monroe St & E Montgomery Ave | A (A)               | A (A)     | A (A)                                             | A (A)                                                        |
| Monroe St & Monroe Pl        | A (A)               | A (A)     | A (A)                                             | A (A)                                                        |
| Monroe St & E Jefferson St   | B (C)               | B (C)     | C (D)                                             | C (C)                                                        |
| Monroe St & Fleet St         | B (B)               | B (B)     | B (B)                                             | B (B)                                                        |
| Maryland Ave & Fleet St      | C (E)               | C (F)     | C (F)                                             | C (F)                                                        |

### Construction Costs

Based on the estimated quantities for each concept, the planning level construction cost is:

- Concept 1, Off-road bike path: \$1,000,000
- Concept 2, On-road cycletrack: \$400,000
- Concept 3, Combination of off-road path and on-road lanes: \$760,000

These estimates include a cost for relocating overhead utilities, relocating drainage inlets, driveway apron reconstruction, new curb and gutter, new asphalt path, new traffic signals, signing and pavement markings. The cost estimate breakdown is shown in [Appendix D](#).

### Public Meeting

On May 4, 2023, a virtual public meeting was held with City residents. The meeting was advertised by the City's Department of Public Works, and it coincided with the publishing of a presentation and conceptual drawings set on the City's website. The public meeting consisted of a presentation, review of the concept plans and discussion of the different options. The presentation can be found in [Appendix](#)

<sup>1</sup> While the LOS in the PM peak hour at the intersection of Maryland Ave at Fleet Street degrades from an E to F, in reality the average vehicle delay only degrades from 80 seconds to 81 seconds, which happens to be the numerical threshold between the assigned letter grades for LOS.



ATTACHMENT A

## Fleet and Monroe Streets, Complete Streets Study



E and generally covered the project's purpose and need; concept overview; impacts; design assumptions, and next steps in project process. A question and answer session with residents followed the presentation, with a summary of the comments/questions below:

- Proposed parking removal (7 spaces) on Fleet Street, east of Monroe Street, is acceptable, since there is rarely any vehicle parked there.
- Given the added activity expected on Fleet Street, provide better pedestrian/bike lighting.
- Preference for scooter drop off areas and public bike racks along Fleet and Monroe Streets
- Pedestrian waiting areas at intersections are crowded; during the next design stage of the project, incorporate large pedestrian landing areas at all quadrants of Fleet/Monroe.
- The current configuration of Fleet Street has two off-set eastbound/westbound shared-left lanes at the east and west approaches to Monroe Street. When there is a left-turning vehicle in each of the lanes at the same time, they obscure each other from seeing upstream traffic, making left turn maneuvers difficult. Request for a left arrow was made.
  - *Note: Both proposed options reduce Fleet Street to 3 lanes with opposing (i.e., not offset) left turn only lanes. This configuration will substantially reduce vehicle obstruction of upstream through traffic for both eastbound and westbound drivers.*

## DESIGN CONSIDERATIONS AND NEXT STEPS

### Design Summary and Future Considerations

Generally speaking, design considerations for each concept include:

- Complete Streets can be accommodated on both Monroe Streets and Fleets by incorporating dedicated bike (and micromobility) only facilities, because sidewalk exists on both sides of both roads. Additionally, these bike facilities can provide a buffer between pedestrians and vehicle traffic and maintain vertical and horizontal separation of the SUP from vehicle traffic. By providing a wide-enough SUP, cyclists and pedestrians could mix with obstructing each other.
- The on-road option is shown having a horizontal and vertical buffer from the vehicle travel lanes, consisting of a three foot wide precast concrete curb. There are other less expensive buffers such as a painted hatched buffer with alternating flex posts and wheel stops. A key design requirement is ample horizontal buffer (minimum 3 feet) and a vertical buffer. The raised bike-only side path generally has a 3-foot buffer between it and the curb. This buffer is shown as grass to accommodate roadside signage, where needed.
- Bike facility width is between 9 and 10 feet. Because the path or cycletrack is not a shared use, eight-foot wide pinch points can be allowed to avoid utility pole or light post relocation. If the bike path is immediately adjacent to the sidewalk, a different material than concrete should be used. Additionally, bike markings should be applied along the path.

## Fleet and Monroe Streets, Complete Streets Study



- Design should incorporate ADA compliance through bus stops, per Montgomery County's bus stop design guidelines.
- If a cycle track is chosen for Fleet Street, the buffers between the bike lanes and travel lanes need to have ample openings to allow a vehicle to safely back out of the residential driveways (see Figure 14).
- Design should minimize mature tree removal.
- Design should minimize expensive utility relocations, such as above ground utility poles, by meandering a bike path or narrowing at spot locations.

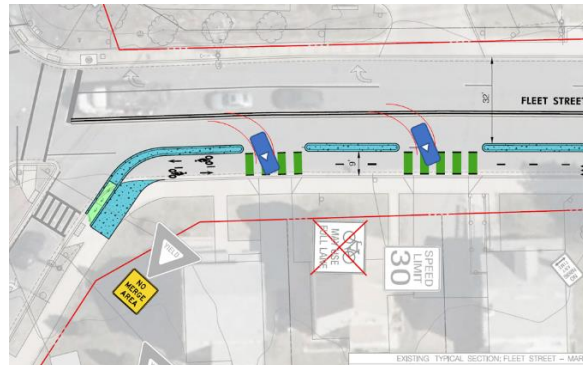


Figure 14: Vehicles backing up onto Fleet Street

- Design should consider ease of long-term maintenance.
- To minimize costs for the raised bike path option, consider channel drain can be utilized in lieu of relocating inlets, where the curb line is moved. See Figure 15.
- Because each option has over 5,000 square feet of disturbance, stormwater management mitigation is required.
- A protected intersection is recommended at the intersection of Fleet Street and Monroe Street, as shown in the concepts, however, protected only phasing for cyclists is likely not needed as turn volumes are generally low.
- Coordination with MDOT SHA during the design phase of the project is required to address crossing MD 28. A on-road cycletrack will require protected, but not exclusive WALK phase (coincident with the pedestrian WALK phase), but an offroad bike path adjacent to the sidewalk may not require a distinct phase for crossing MD 28, depending on the design of the crosswalk. A shared bike and pedestrian crossing, for example, may eliminate the need for a dedicated WALK phase for cyclists. Irrespective of the selected concept, modification of the northbound and southbound lane usage, as well as minor signal timing adjustments, will maintain the intersection with an LOS D or better.
- Bike wayfinding signage and destination markers are recommended during the next design phase.



Figure 15: example of channel drain under sidewalk

## Preferred Option and Next Steps in the Design Process

The next step in the design process is to select a concept for advancement into 30% design and then secure funding for 30% design. Based on follow-up discussions, City Staff is recommending the grade-separated bike path option for advancement into 30% design. This design stage will include topographic survey and a boundary survey to locate exact lot lines and public right of way limits, as well as any existing easements. This stage will also evaluate options for stormwater mitigation and identify any additional permits required for construction. 30% design also entails a more accurate construction cost estimate. Additionally, all public and private stakeholders should be identified and notified of the next design stage, even if all construction occurs in public right of way. An additional public meeting should be held during the 30% design phase to ensure that all public comments from this current stage were addressed.

During the 30% design phase, the process should begin to secure funding for 65% Design and Final Design. During the 65% design phase, all necessary permits are obtained including SWM approval by Montgomery

## Fleet and Monroe Streets, Complete Streets Study



County DPS. The final step is to secure funding for, and begin, construction. Note, that construction (and even design) can occur in phases, as this project has the potential to be both costly and could require a significant amount of time if utility relocation is needed.

## FUNDING OPPORTUNITIES

Funding for projects can often be an obstacle to implementation. In addition to using local funds, there are several state/federal grant programs that offer monetary support for implementing the recommended bicycle facilities in this study. Some of the following funding sources identified as applicable include:

**Transportation Alternatives Program (TAP).** This program is administered and supported by the Maryland State Highway Administration, with reimbursement from the Federal Highway Administration, for the purpose of funding projects that enhance the cultural, aesthetic, historic, and environmental aspects of the State's intermodal transportation system. The program is set up to sub-allocate fifty percent of the funding directly to local Metropolitan Planning Organizations who are the responsible reviewers of proposed projects within their jurisdiction. Recommendations under this study would be eligible as they meet the requirements of 1) related to surface transportation; and 2) meet at least one of the ten qualifying TAP categories – such as New Walking and Biking Connections and Facilities; or Safe Routes to School (SRTS); or related environmental mitigation. Project sponsors are responsible for design, management, construction, implementation, and permits as well as a minimum of 20% of all project costs. MDOT recently updated their tap manual at: [https://roads.maryland.gov/OPPEN/TAP\\_Manual\\_2022.pdf](https://roads.maryland.gov/OPPEN/TAP_Manual_2022.pdf).

**Maryland Bikeways Program.** Supported and administered by the Maryland Department of Transportation, the goal of the program is to fill in the gaps in Maryland's bike network to support biking and bikeshare programs. An eligible project meets one of the following criteria: 1) located substantially within the Priority Funding Area (PFA) and/or located within three miles of a rail transit station or major bus transit hub, 2) provide or enhance bicycle access along any gap identified in the Statewide Trails Plan "A Greener Way to Go", and/or 3) identified as a transportation priority in a County's most recent annual priority letter submitted to MDOT. Note that all projects in this report are within a PFA (either State or Municipal PFA) and all projects are within the three miles of rail transit. The local match requirements are a) zero percent for priority minor retrofit, b) twenty percent for other priority projects, and c) fifty percent for non-priority projects. The match may include cash or in-kind services contributing to the project such as expenditures up to twenty-four months prior to a Bikeways project award.

**Safe Routes to Schools.** Administered by the State Highway Administration and supported by an 80/20 federal to local match, this program funds infrastructure and non-infrastructure projects that support safe and sustainable routes for K-8 aged children to walk, roll, or bicycle to school. Projects categorized as safe routes to school must be requested through the larger Transportation Alternatives Program. Eligible project types that overlap with the recommendations under this study include traffic calming and speed reduction improvements, bike/pedestrian crossing improvements, and bicycle parking. This program would be applicable, as Richard Montgomery High School is located within the project area – allowing the City or County to qualify for Safe Routes to School funding.

**MWCOG Transportation Land Use Connections (TLC) Grants.** As members of MWCOG, Rockville and Montgomery County can apply for Planning and Design grants to fund studies or designs for planned projects. The TLC Program will provide consultant assistance, valued between \$30,000 - \$60,000 for



ATTACHMENT A

Fleet and Monroe Streets, Complete Streets Study



planning projects and up to \$80,000 for design or preliminary engineering projects, for projects that promote mixed-use, walkable communities and support a variety of transportation alternatives. These are annual grants and are competitive among the jurisdictional members.

***MWCOG Transit Within Reach Program (TWR) Grants.*** The Transit Within Reach Program provides funding for design and preliminary engineering (up to 30% design) for projects that improve biking and walking connections to existing high-capacity transit stations, including include Metrorail, commuter rail, light rail, streetcar, bus rapid transit, and multimodal stations. Project categories may include (but are not limited to): Cost estimates of improvements; engineering systems description and analysis; preliminary or schematic drawings with site plans and elevations; renderings of site massing, elevation, or facility interior/exterior spaces; Site surveys. Grants are currently offered on a biennial cycle between FY 2021 and FY 2026. Approximately \$80,000 will be available per grant.

ATTACHMENT A

Fleet and Monroe Streets, Complete Streets Study  
APPENDICES



## **Appendix A: Traffic counts**

ATTACHMENT A

# City of Rockville

Traffic & Transportation Division

File Name : MDave@FleetSt  
Site Code : 00000028  
Start Date : 10/6/2022  
Page No : 1

Groups Printed- Unshifted

|               | NB Maryland Ave<br>From North |      |      |      | WB Fleet St<br>From East |      |      |      | SB Maryland Ave<br>From South |      |      |      | City Hall Lower Parking Lot<br>From West |      |      |      | Int. Total |
|---------------|-------------------------------|------|------|------|--------------------------|------|------|------|-------------------------------|------|------|------|------------------------------------------|------|------|------|------------|
| Start Time    | Right                         | Thru | Left | Peds | Right                    | Thru | Left | Peds | Right                         | Thru | Left | Peds | Right                                    | Thru | Left | Peds |            |
| 07:00 AM      | 1                             | 45   | 8    | 2    | 3                        | 0    | 34   | 2    | 54                            | 30   | 0    | 0    | 0                                        | 0    | 0    | 0    | 179        |
| 07:15 AM      | 0                             | 80   | 13   | 1    | 5                        | 0    | 35   | 0    | 85                            | 29   | 0    | 0    | 0                                        | 0    | 0    | 3    | 251        |
| 07:30 AM      | 1                             | 49   | 31   | 1    | 27                       | 1    | 87   | 0    | 174                           | 50   | 0    | 0    | 0                                        | 0    | 0    | 1    | 422        |
| 07:45 AM      | 0                             | 82   | 30   | 1    | 54                       | 0    | 116  | 1    | 105                           | 83   | 0    | 1    | 0                                        | 0    | 0    | 1    | 474        |
| Total         | 2                             | 256  | 82   | 5    | 89                       | 1    | 272  | 3    | 418                           | 192  | 0    | 1    | 0                                        | 0    | 0    | 5    | 1326       |
| 08:00 AM      | 2                             | 57   | 13   | 1    | 8                        | 0    | 82   | 1    | 90                            | 58   | 0    | 1    | 0                                        | 1    | 1    | 4    | 319        |
| 08:15 AM      | 3                             | 57   | 13   | 0    | 12                       | 1    | 30   | 0    | 82                            | 85   | 0    | 1    | 0                                        | 0    | 1    | 1    | 286        |
| 08:30 AM      | 2                             | 53   | 12   | 0    | 7                        | 1    | 40   | 0    | 88                            | 80   | 0    | 1    | 0                                        | 1    | 3    | 0    | 288        |
| 08:45 AM      | 4                             | 43   | 6    | 1    | 8                        | 1    | 29   | 0    | 102                           | 80   | 0    | 0    | 0                                        | 1    | 3    | 1    | 279        |
| Total         | 11                            | 210  | 44   | 2    | 35                       | 3    | 181  | 1    | 362                           | 303  | 0    | 3    | 0                                        | 3    | 8    | 6    | 1172       |
| 09:00 AM      | 3                             | 48   | 8    | 0    | 6                        | 1    | 28   | 1    | 88                            | 68   | 0    | 0    | 0                                        | 0    | 1    | 2    | 254        |
| *** BREAK *** |                               |      |      |      |                          |      |      |      |                               |      |      |      |                                          |      |      |      |            |
| Total         | 3                             | 48   | 8    | 0    | 6                        | 1    | 28   | 1    | 88                            | 68   | 0    | 0    | 0                                        | 0    | 1    | 2    | 254        |
| *** BREAK *** |                               |      |      |      |                          |      |      |      |                               |      |      |      |                                          |      |      |      |            |
| 04:00 PM      | 0                             | 65   | 5    | 0    | 19                       | 0    | 74   | 2    | 77                            | 77   | 0    | 0    | 0                                        | 2    | 2    | 2    | 325        |
| 04:15 PM      | 0                             | 79   | 6    | 0    | 12                       | 0    | 86   | 3    | 92                            | 91   | 0    | 3    | 1                                        | 1    | 0    | 0    | 374        |
| 04:30 PM      | 1                             | 71   | 5    | 0    | 18                       | 0    | 75   | 4    | 116                           | 76   | 0    | 2    | 0                                        | 0    | 1    | 0    | 369        |
| 04:45 PM      | 1                             | 61   | 4    | 2    | 28                       | 0    | 89   | 1    | 111                           | 102  | 0    | 1    | 0                                        | 1    | 5    | 3    | 409        |
| Total         | 2                             | 276  | 20   | 2    | 77                       | 0    | 324  | 10   | 396                           | 346  | 0    | 6    | 1                                        | 4    | 8    | 5    | 1477       |
| 05:00 PM      | 0                             | 71   | 8    | 0    | 21                       | 1    | 73   | 2    | 100                           | 69   | 0    | 1    | 0                                        | 1    | 2    | 2    | 351        |
| 05:15 PM      | 1                             | 105  | 4    | 3    | 13                       | 0    | 65   | 1    | 88                            | 85   | 0    | 1    | 2                                        | 2    | 4    | 0    | 374        |
| 05:30 PM      | 0                             | 86   | 9    | 2    | 16                       | 0    | 43   | 3    | 109                           | 104  | 0    | 1    | 0                                        | 0    | 2    | 3    | 378        |
| 05:45 PM      | 0                             | 69   | 6    | 0    | 16                       | 0    | 57   | 2    | 118                           | 94   | 0    | 0    | 0                                        | 0    | 2    | 0    | 364        |
| Total         | 1                             | 331  | 27   | 5    | 66                       | 1    | 238  | 8    | 415                           | 352  | 0    | 3    | 2                                        | 3    | 10   | 5    | 1467       |
| 06:00 PM      | 0                             | 61   | 5    | 0    | 10                       | 0    | 50   | 0    | 102                           | 98   | 0    | 0    | 0                                        | 0    | 0    | 1    | 327        |
| Grand Total   | 19                            | 1182 | 186  | 14   | 283                      | 6    | 1093 | 23   | 1781                          | 1359 | 0    | 13   | 3                                        | 10   | 27   | 24   | 6023       |
| Apprch %      | 1.4                           | 84.4 | 13.3 | 1    | 20.1                     | 0.4  | 77.8 | 1.6  | 56.5                          | 43.1 | 0    | 0.4  | 4.7                                      | 15.6 | 42.2 | 37.5 |            |
| Total %       | 0.3                           | 19.6 | 3.1  | 0.2  | 4.7                      | 0.1  | 18.1 | 0.4  | 29.6                          | 22.6 | 0    | 0.2  | 0                                        | 0.2  | 0.4  | 0.4  |            |

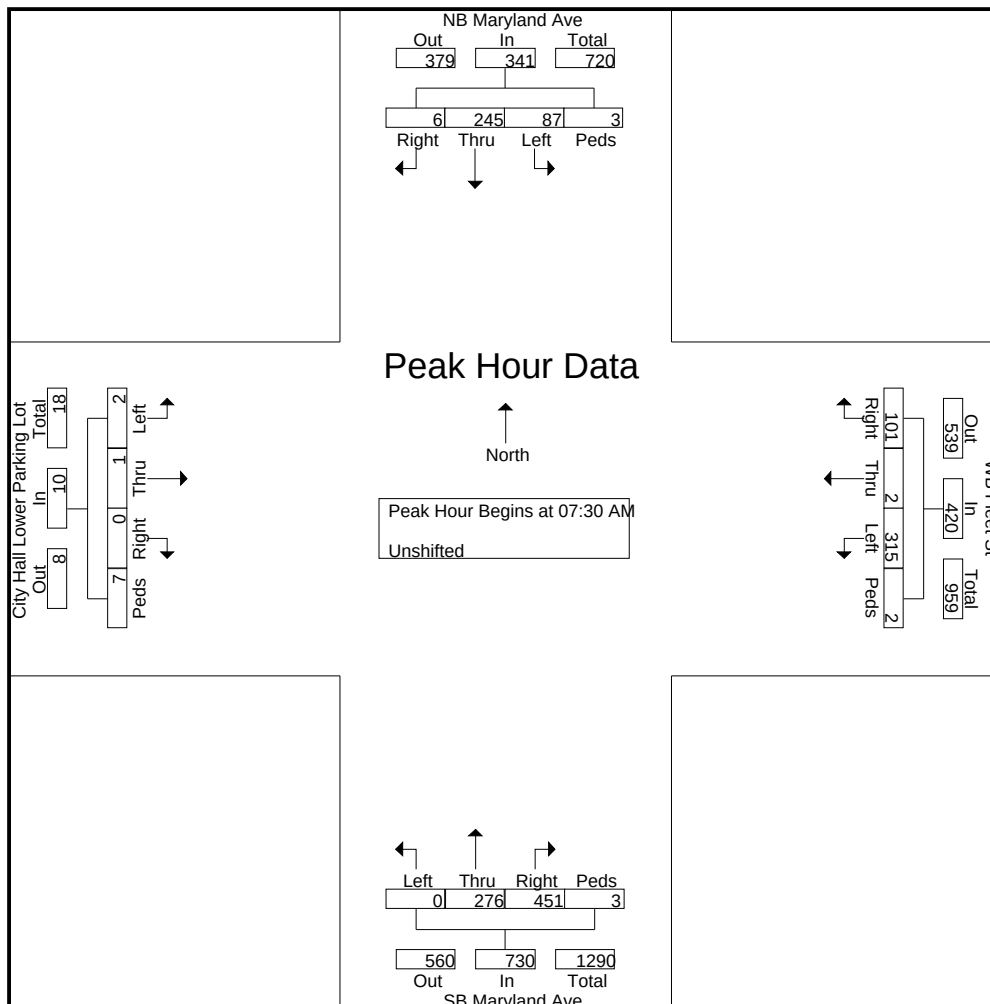
ATTACHMENT A

# City of Rockville

Traffic & Transportation Division

File Name : MDave@FleetSt  
Site Code : 00000028  
Start Date : 10/6/2022  
Page No : 2

|                                                            | NB Maryland Ave<br>From North |      |      |      |            | WB Fleet St<br>From East |      |      |      |            | SB Maryland Ave<br>From South |      |      |      |            | City Hall Lower Parking Lot<br>From West |      |      |      |            |            |
|------------------------------------------------------------|-------------------------------|------|------|------|------------|--------------------------|------|------|------|------------|-------------------------------|------|------|------|------------|------------------------------------------|------|------|------|------------|------------|
| Start Time                                                 | Right                         | Thru | Left | Peds | App. Total | Right                    | Thru | Left | Peds | App. Total | Right                         | Thru | Left | Peds | App. Total | Right                                    | Thru | Left | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1 |                               |      |      |      |            |                          |      |      |      |            |                               |      |      |      |            |                                          |      |      |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:30 AM       |                               |      |      |      |            |                          |      |      |      |            |                               |      |      |      |            |                                          |      |      |      |            |            |
| 07:30 AM                                                   | 1                             | 49   | 31   | 1    | 82         | 27                       | 1    | 87   | 0    | 115        | 174                           | 50   | 0    | 0    | 224        | 0                                        | 0    | 0    | 1    | 1          | 422        |
| 07:45 AM                                                   | 0                             | 82   | 30   | 1    | 113        | 54                       | 0    | 116  | 1    | 171        | 105                           | 83   | 0    | 1    | 189        | 0                                        | 0    | 0    | 1    | 1          | 474        |
| 08:00 AM                                                   | 2                             | 57   | 13   | 1    | 73         | 8                        | 0    | 82   | 1    | 91         | 90                            | 58   | 0    | 1    | 149        | 0                                        | 1    | 1    | 4    | 6          | 319        |
| 08:15 AM                                                   | 3                             | 57   | 13   | 0    | 73         | 12                       | 1    | 30   | 0    | 43         | 82                            | 85   | 0    | 1    | 168        | 0                                        | 0    | 1    | 1    | 2          | 286        |
| Total Volume                                               | 6                             | 245  | 87   | 3    | 341        | 101                      | 2    | 315  | 2    | 420        | 451                           | 276  | 0    | 3    | 730        | 0                                        | 1    | 2    | 7    | 10         | 1501       |
| % App. Total                                               | 1.8                           | 71.8 | 25.5 | 0.9  |            | 24                       | 0.5  | 75   | 0.5  |            | 61.8                          | 37.8 | 0    | 0.4  |            | 0                                        | 10   | 20   | 70   |            |            |
| PHF                                                        | .500                          | .747 | .702 | .750 | .754       | .468                     | .500 | .679 | .500 | .614       | .648                          | .812 | .000 | .750 | .815       | .000                                     | .250 | .500 | .438 | .417       | .792       |



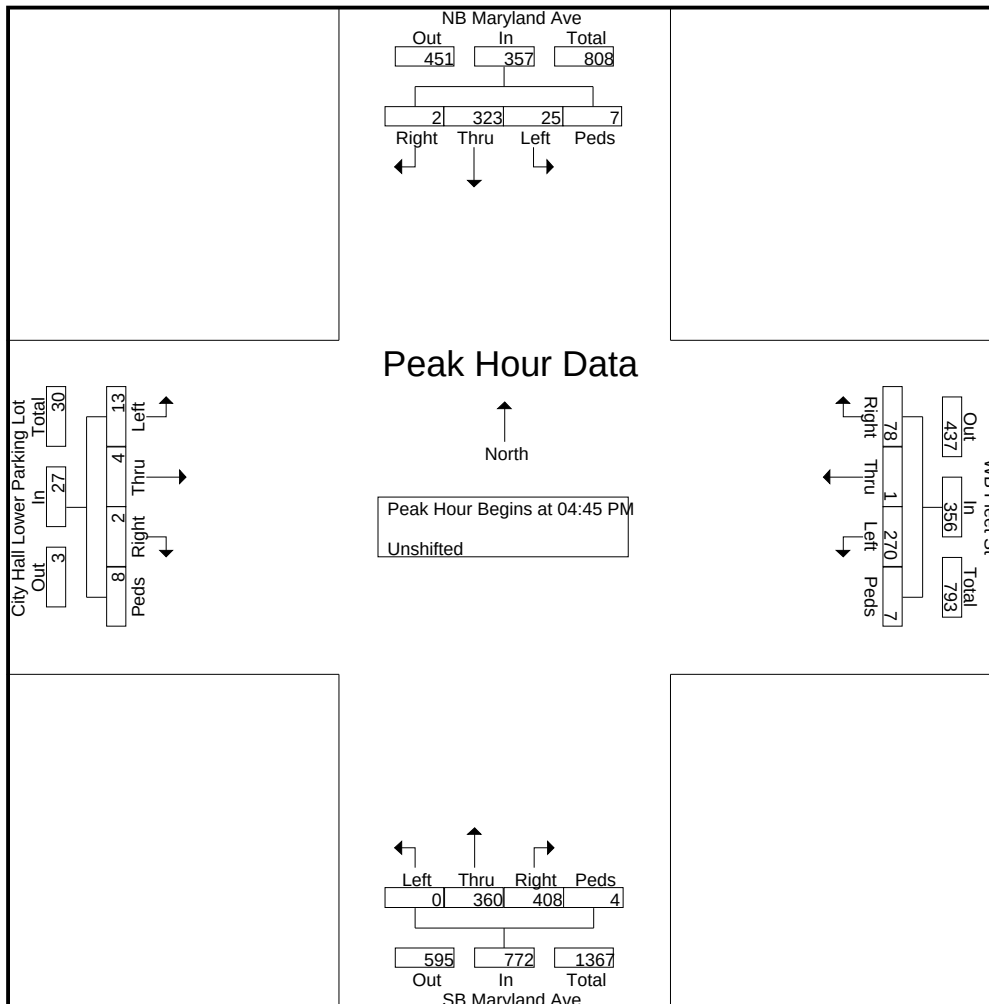
ATTACHMENT A

# City of Rockville

Traffic & Transportation Division

File Name : MDave@FleetSt  
Site Code : 00000028  
Start Date : 10/6/2022  
Page No : 3

|                                                            | NB Maryland Ave<br>From North |      |      |      |            | WB Fleet St<br>From East |      |      |      |            | SB Maryland Ave<br>From South |      |      |          |            | City Hall Lower Parking Lot<br>From West |      |      |      |            |            |
|------------------------------------------------------------|-------------------------------|------|------|------|------------|--------------------------|------|------|------|------------|-------------------------------|------|------|----------|------------|------------------------------------------|------|------|------|------------|------------|
| Start Time                                                 | Right                         | Thru | Left | Peds | App. Total | Right                    | Thru | Left | Peds | App. Total | Right                         | Thru | Left | Peds     | App. Total | Right                                    | Thru | Left | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 12:00 PM to 06:00 PM - Peak 1 of 1 |                               |      |      |      |            |                          |      |      |      |            |                               |      |      |          |            |                                          |      |      |      |            |            |
| Peak Hour for Entire Intersection Begins at 04:45 PM       |                               |      |      |      |            |                          |      |      |      |            |                               |      |      |          |            |                                          |      |      |      |            |            |
| 04:45 PM                                                   | 1                             | 61   | 4    | 2    | 68         | 28                       | 0    | 89   | 1    | 118        | 111                           | 102  | 0    | 1        | 214        | 0                                        | 1    | 5    | 3    | 9          | 409        |
| 05:00 PM                                                   | 0                             | 71   | 8    | 0    | 79         | 21                       | 1    | 73   | 2    | 97         | 100                           | 69   | 0    | 1        | 170        | 0                                        | 1    | 2    | 2    | 5          | 351        |
| 05:15 PM                                                   | 1                             | 105  | 4    | 3    | 113        | 13                       | 0    | 65   | 1    | 79         | 88                            | 85   | 0    | 1        | 174        | 2                                        | 2    | 4    | 0    | 8          | 374        |
| 05:30 PM                                                   | 0                             | 86   | 9    | 2    | 97         | 16                       | 0    | 43   | 3    | 62         | 109                           | 104  | 0    | 1        | 214        | 0                                        | 0    | 2    | 3    | 5          | 378        |
| Total Volume                                               | 2                             | 323  | 25   | 7    | 357        | 78                       | 1    | 270  | 7    | 356        | 408                           | 360  | 0    | 4        | 772        | 2                                        | 4    | 13   | 8    | 27         | 1512       |
| % App. Total                                               | 0.6                           | 90.5 | 7    | 2    |            | 21.9                     | 0.3  | 75.8 | 2    |            | 52.8                          | 46.6 | 0    | 0.5      |            | 7.4                                      | 14.8 | 48.1 | 29.6 |            |            |
| PHF                                                        | .500                          | .769 | .694 | .583 | .790       | .696                     | .250 | .758 | .583 | .754       | .919                          | .865 | .000 | 1.0<br>0 | .902       | .250                                     | .500 | .650 | .667 | .750       | .924       |



ATTACHMENT A

# City of Rockville

Traffic & Transportation Division

File Name : Monroe St@Fleet St  
Site Code : 00000036  
Start Date : 10/11/2022  
Page No : 1

Groups Printed- Unshifted

|               | SB Monroe St<br>From North |      |      |      | WB Fleet St<br>From East |      |      |      | NB Monroe St<br>From South |      |      |      | EB Fleet St<br>From West |      |      |      | Int. Total |
|---------------|----------------------------|------|------|------|--------------------------|------|------|------|----------------------------|------|------|------|--------------------------|------|------|------|------------|
| Start Time    | Right                      | Thru | Left | Peds | Right                    | Thru | Left | Peds | Right                      | Thru | Left | Peds | Right                    | Thru | Left | Peds |            |
| 07:00 AM      | 10                         | 10   | 5    | 1    | 4                        | 13   | 1    | 0    | 3                          | 13   | 1    | 4    | 6                        | 37   | 16   | 6    | 130        |
| 07:15 AM      | 13                         | 3    | 11   | 2    | 6                        | 26   | 1    | 2    | 1                          | 3    | 4    | 1    | 6                        | 49   | 25   | 10   | 163        |
| 07:30 AM      | 13                         | 6    | 18   | 12   | 22                       | 59   | 2    | 1    | 5                          | 9    | 8    | 4    | 10                       | 134  | 26   | 21   | 350        |
| 07:45 AM      | 22                         | 12   | 16   | 6    | 41                       | 145  | 4    | 0    | 8                          | 23   | 15   | 5    | 15                       | 110  | 38   | 15   | 475        |
| Total         | 58                         | 31   | 50   | 21   | 73                       | 243  | 8    | 3    | 17                         | 48   | 28   | 14   | 37                       | 330  | 105  | 52   | 1118       |
| 08:00 AM      | 24                         | 13   | 5    | 2    | 9                        | 50   | 0    | 0    | 3                          | 22   | 11   | 7    | 19                       | 40   | 40   | 3    | 248        |
| 08:15 AM      | 24                         | 12   | 4    | 0    | 9                        | 21   | 4    | 4    | 5                          | 15   | 9    | 3    | 18                       | 30   | 44   | 1    | 203        |
| 08:30 AM      | 20                         | 13   | 8    | 0    | 4                        | 25   | 2    | 3    | 5                          | 27   | 10   | 5    | 9                        | 27   | 45   | 3    | 206        |
| 08:45 AM      | 19                         | 12   | 4    | 0    | 4                        | 20   | 3    | 0    | 3                          | 8    | 7    | 1    | 19                       | 39   | 39   | 2    | 180        |
| Total         | 87                         | 50   | 21   | 2    | 26                       | 116  | 9    | 7    | 16                         | 72   | 37   | 16   | 65                       | 136  | 168  | 9    | 837        |
| 09:00 AM      | 13                         | 10   | 2    | 1    | 5                        | 21   | 3    | 1    | 3                          | 20   | 6    | 4    | 15                       | 39   | 41   | 1    | 185        |
| *** BREAK *** |                            |      |      |      |                          |      |      |      |                            |      |      |      |                          |      |      |      |            |
| Total         | 13                         | 10   | 2    | 1    | 5                        | 21   | 3    | 1    | 3                          | 20   | 6    | 4    | 15                       | 39   | 41   | 1    | 185        |
| *** BREAK *** |                            |      |      |      |                          |      |      |      |                            |      |      |      |                          |      |      |      |            |
| 04:00 PM      | 23                         | 21   | 2    | 1    | 15                       | 46   | 1    | 6    | 0                          | 23   | 5    | 3    | 20                       | 41   | 32   | 0    | 239        |
| 04:15 PM      | 20                         | 18   | 2    | 1    | 14                       | 42   | 2    | 3    | 5                          | 14   | 2    | 3    | 17                       | 28   | 35   | 4    | 210        |
| 04:30 PM      | 40                         | 10   | 2    | 0    | 9                        | 42   | 4    | 1    | 3                          | 19   | 5    | 7    | 16                       | 51   | 30   | 3    | 242        |
| 04:45 PM      | 33                         | 16   | 3    | 2    | 13                       | 31   | 6    | 4    | 1                          | 19   | 3    | 8    | 24                       | 44   | 37   | 3    | 247        |
| Total         | 116                        | 65   | 9    | 4    | 51                       | 161  | 13   | 14   | 9                          | 75   | 15   | 21   | 77                       | 164  | 134  | 10   | 938        |
| 05:00 PM      | 31                         | 19   | 1    | 6    | 9                        | 64   | 2    | 9    | 2                          | 11   | 2    | 0    | 17                       | 56   | 36   | 0    | 265        |
| 05:15 PM      | 30                         | 28   | 3    | 1    | 13                       | 43   | 1    | 5    | 1                          | 17   | 1    | 8    | 26                       | 38   | 54   | 1    | 270        |
| 05:30 PM      | 27                         | 27   | 3    | 6    | 4                        | 37   | 1    | 3    | 2                          | 13   | 3    | 5    | 30                       | 33   | 43   | 3    | 240        |
| 05:45 PM      | 16                         | 24   | 2    | 1    | 7                        | 31   | 3    | 2    | 2                          | 22   | 1    | 5    | 16                       | 27   | 29   | 0    | 188        |
| Total         | 104                        | 98   | 9    | 14   | 33                       | 175  | 7    | 19   | 7                          | 63   | 7    | 18   | 89                       | 154  | 162  | 4    | 963        |
| 06:00 PM      | 16                         | 14   | 1    | 3    | 11                       | 30   | 4    | 0    | 3                          | 16   | 7    | 4    | 16                       | 46   | 33   | 0    | 204        |
| Grand Total   | 394                        | 268  | 92   | 45   | 199                      | 746  | 44   | 44   | 55                         | 294  | 100  | 77   | 299                      | 869  | 643  | 76   | 4245       |
| Apprch %      | 49.3                       | 33.5 | 11.5 | 5.6  | 19.3                     | 72.2 | 4.3  | 4.3  | 10.5                       | 55.9 | 19   | 14.6 | 15.8                     | 46.1 | 34.1 | 4    |            |
| Total %       | 9.3                        | 6.3  | 2.2  | 1.1  | 4.7                      | 17.6 | 1    | 1    | 1.3                        | 6.9  | 2.4  | 1.8  | 7                        | 20.5 | 15.1 | 1.8  |            |



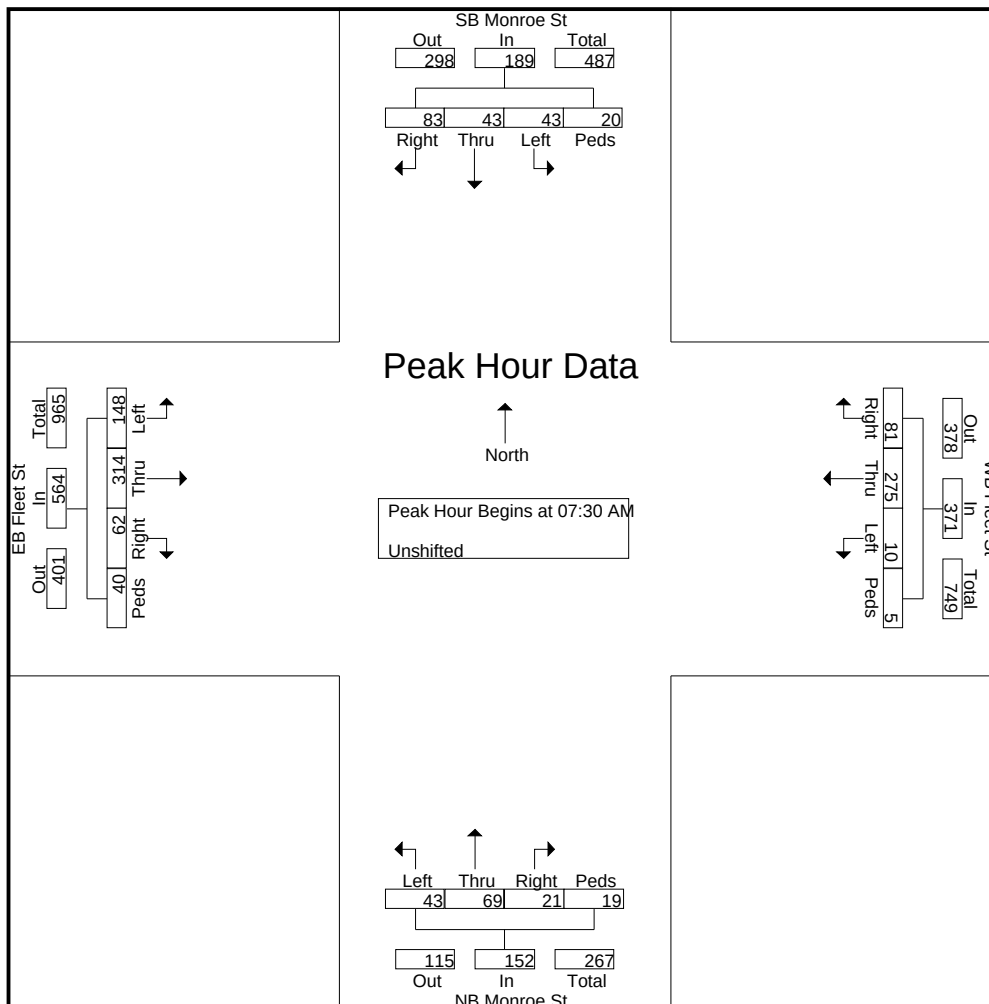
ATTACHMENT A

# City of Rockville

Traffic & Transportation Division

File Name : Monroe St@Fleet St  
Site Code : 00000036  
Start Date : 10/11/2022  
Page No : 2

|                                                            | SB Monroe St<br>From North |      |      |      |            | WB Fleet St<br>From East |      |      |      |            | NB Monroe St<br>From South |      |      |      |            | EB Fleet St<br>From West |      |      |      |            |            |
|------------------------------------------------------------|----------------------------|------|------|------|------------|--------------------------|------|------|------|------------|----------------------------|------|------|------|------------|--------------------------|------|------|------|------------|------------|
| Start Time                                                 | Right                      | Thru | Left | Peds | App. Total | Right                    | Thru | Left | Peds | App. Total | Right                      | Thru | Left | Peds | App. Total | Right                    | Thru | Left | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1 |                            |      |      |      |            |                          |      |      |      |            |                            |      |      |      |            |                          |      |      |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:30 AM       |                            |      |      |      |            |                          |      |      |      |            |                            |      |      |      |            |                          |      |      |      |            |            |
| 07:30 AM                                                   | 13                         | 6    | 18   | 12   | 49         | 22                       | 59   | 2    | 1    | 84         | 5                          | 9    | 8    | 4    | 26         | 10                       | 134  | 26   | 21   | 191        | 350        |
| 07:45 AM                                                   | 22                         | 12   | 16   | 6    | 56         | 41                       | 145  | 4    | 0    | 190        | 8                          | 23   | 15   | 5    | 51         | 15                       | 110  | 38   | 15   | 178        | 475        |
| 08:00 AM                                                   | 24                         | 13   | 5    | 2    | 44         | 9                        | 50   | 0    | 0    | 59         | 3                          | 22   | 11   | 7    | 43         | 19                       | 40   | 40   | 3    | 102        | 248        |
| 08:15 AM                                                   | 24                         | 12   | 4    | 0    | 40         | 9                        | 21   | 4    | 4    | 38         | 5                          | 15   | 9    | 3    | 32         | 18                       | 30   | 44   | 1    | 93         | 203        |
| Total Volume                                               | 83                         | 43   | 43   | 20   | 189        | 81                       | 275  | 10   | 5    | 371        | 21                         | 69   | 43   | 19   | 152        | 62                       | 314  | 148  | 40   | 564        | 1276       |
| % App. Total                                               | 43.9                       | 22.8 | 22.8 | 10.6 |            | 21.8                     | 74.1 | 2.7  | 1.3  |            | 13.8                       | 45.4 | 28.3 | 12.5 |            | 11                       | 55.7 | 26.2 | 7.1  |            |            |
| PHF                                                        | .865                       | .827 | .597 | .417 | .844       | .494                     | .474 | .625 | .313 | .488       | .656                       | .750 | .717 | .679 | .745       | .816                     | .586 | .841 | .476 | .738       | .672       |



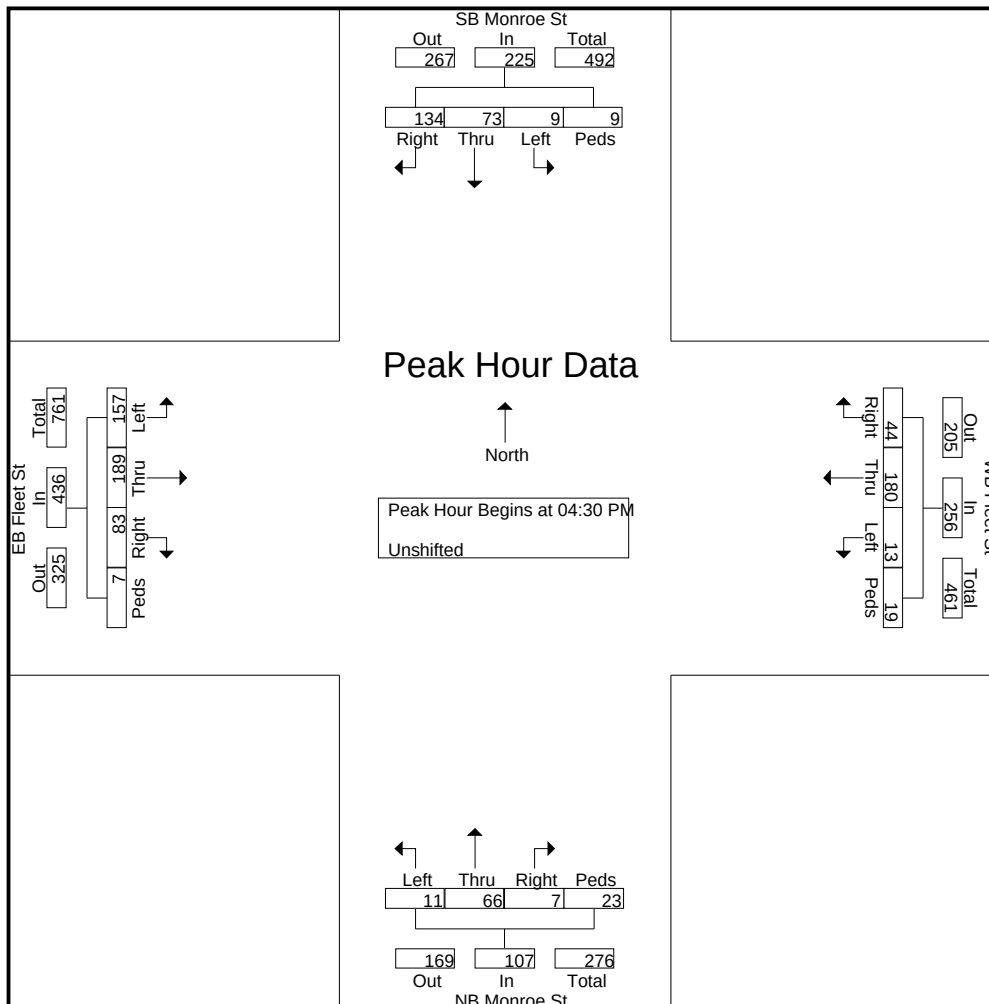
ATTACHMENT A

# City of Rockville

Traffic & Transportation Division

File Name : Monroe St@Fleet St  
Site Code : 00000036  
Start Date : 10/11/2022  
Page No : 3

|                                                            | SB Monroe St<br>From North |      |      |      |            | WB Fleet St<br>From East |      |      |      |            | NB Monroe St<br>From South |      |      |      |            | EB Fleet St<br>From West |      |      |      |            |            |
|------------------------------------------------------------|----------------------------|------|------|------|------------|--------------------------|------|------|------|------------|----------------------------|------|------|------|------------|--------------------------|------|------|------|------------|------------|
| Start Time                                                 | Right                      | Thru | Left | Peds | App. Total | Right                    | Thru | Left | Peds | App. Total | Right                      | Thru | Left | Peds | App. Total | Right                    | Thru | Left | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 12:00 PM to 06:00 PM - Peak 1 of 1 |                            |      |      |      |            |                          |      |      |      |            |                            |      |      |      |            |                          |      |      |      |            |            |
| Peak Hour for Entire Intersection Begins at 04:30 PM       |                            |      |      |      |            |                          |      |      |      |            |                            |      |      |      |            |                          |      |      |      |            |            |
| 04:30 PM                                                   | 40                         | 10   | 2    | 0    | 52         | 9                        | 42   | 4    | 1    | 56         | 3                          | 19   | 5    | 7    | 34         | 16                       | 51   | 30   | 3    | 100        | 242        |
| 04:45 PM                                                   | 33                         | 16   | 3    | 2    | 54         | 13                       | 31   | 6    | 4    | 54         | 1                          | 19   | 3    | 8    | 31         | 24                       | 44   | 37   | 3    | 108        | 247        |
| 05:00 PM                                                   | 31                         | 19   | 1    | 6    | 57         | 9                        | 64   | 2    | 9    | 84         | 2                          | 11   | 2    | 0    | 15         | 17                       | 56   | 36   | 0    | 109        | 265        |
| 05:15 PM                                                   | 30                         | 28   | 3    | 1    | 62         | 13                       | 43   | 1    | 5    | 62         | 1                          | 17   | 1    | 8    | 27         | 26                       | 38   | 54   | 1    | 119        | 270        |
| Total Volume                                               | 134                        | 73   | 9    | 9    | 225        | 44                       | 180  | 13   | 19   | 256        | 7                          | 66   | 11   | 23   | 107        | 83                       | 189  | 157  | 7    | 436        | 1024       |
| % App. Total                                               | 59.6                       | 32.4 | 4    | 4    |            | 17.2                     | 70.3 | 5.1  | 7.4  |            | 6.5                        | 61.7 | 10.3 | 21.5 |            | 19                       | 43.3 | 36   | 1.6  |            |            |
| PHF                                                        | .838                       | .652 | .750 | .375 | .907       | .846                     | .703 | .542 | .528 | .762       | .583                       | .868 | .550 | .719 | .787       | .798                     | .844 | .727 | .583 | .916       | .948       |



ATTACHMENT A

# MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045  
*443-741-3500*

Weather:  
Counted By:  
Town:  
Country

File Name : MD 355 AT MD 28-MD 586  
Site Code : 00000000  
Start Date : 9/20/2022  
Page No : 1

Groups Printed- VEHS&PEDS

| Start Time | MD 355<br>From North |      |       |      |            | MD 586<br>From East |      |       |      |            | MD 355<br>From South |      |       |      |            | MD 28<br>From West |      |       |      |            | Int. Total |
|------------|----------------------|------|-------|------|------------|---------------------|------|-------|------|------------|----------------------|------|-------|------|------------|--------------------|------|-------|------|------------|------------|
|            | Left                 | Thru | Right | Peds | App. Total | Left                | Thru | Right | Peds | App. Total | Left                 | Thru | Right | Peds | App. Total | Left               | Thru | Right | Peds | App. Total |            |
| 06:00 AM   | 14                   | 70   | 1     | 0    | 85         | 0                   | 55   | 21    | 1    | 77         | 8                    | 27   | 0     | 0    | 35         | 0                  | 19   | 23    | 0    | 42         | 239        |
| 06:15 AM   | 16                   | 114  | 3     | 0    | 133        | 0                   | 81   | 32    | 0    | 113        | 10                   | 38   | 0     | 0    | 48         | 0                  | 13   | 32    | 0    | 45         | 339        |
| 06:30 AM   | 41                   | 106  | 4     | 0    | 151        | 0                   | 118  | 46    | 1    | 165        | 15                   | 35   | 0     | 0    | 50         | 0                  | 38   | 28    | 1    | 67         | 433        |
| 06:45 AM   | 34                   | 174  | 5     | 0    | 213        | 0                   | 129  | 59    | 0    | 188        | 18                   | 58   | 0     | 0    | 76         | 0                  | 38   | 48    | 1    | 87         | 564        |
| Total      | 105                  | 464  | 13    | 0    | 582        | 0                   | 383  | 158   | 2    | 543        | 51                   | 158  | 0     | 0    | 209        | 0                  | 108  | 131   | 2    | 241        | 1575       |
| 07:00 AM   | 39                   | 184  | 6     | 0    | 229        | 0                   | 120  | 60    | 1    | 181        | 15                   | 58   | 0     | 0    | 73         | 0                  | 42   | 50    | 3    | 95         | 578        |
| 07:15 AM   | 62                   | 276  | 13    | 0    | 351        | 0                   | 149  | 62    | 0    | 211        | 23                   | 75   | 0     | 0    | 98         | 0                  | 55   | 53    | 7    | 115        | 775        |
| 07:30 AM   | 66                   | 351  | 12    | 0    | 429        | 0                   | 162  | 87    | 0    | 249        | 43                   | 130  | 0     | 0    | 173        | 0                  | 65   | 64    | 5    | 134        | 985        |
| 07:45 AM   | 78                   | 298  | 9     | 0    | 385        | 0                   | 173  | 122   | 0    | 295        | 41                   | 131  | 0     | 0    | 172        | 0                  | 75   | 83    | 2    | 160        | 1012       |
| Total      | 245                  | 1109 | 40    | 0    | 1394       | 0                   | 604  | 331   | 1    | 936        | 122                  | 394  | 0     | 0    | 516        | 0                  | 237  | 250   | 17   | 504        | 3350       |
| 08:00 AM   | 93                   | 296  | 10    | 0    | 399        | 0                   | 169  | 81    | 2    | 252        | 44                   | 128  | 0     | 0    | 172        | 0                  | 80   | 80    | 0    | 160        | 983        |
| 08:15 AM   | 88                   | 263  | 18    | 0    | 369        | 0                   | 179  | 97    | 0    | 276        | 42                   | 136  | 0     | 0    | 178        | 0                  | 87   | 78    | 3    | 168        | 991        |
| 08:30 AM   | 74                   | 293  | 8     | 1    | 376        | 0                   | 158  | 110   | 3    | 271        | 38                   | 127  | 0     | 0    | 165        | 0                  | 60   | 92    | 0    | 152        | 964        |
| 08:45 AM   | 81                   | 290  | 15    | 0    | 386        | 0                   | 149  | 122   | 3    | 274        | 52                   | 131  | 0     | 0    | 183        | 0                  | 64   | 89    | 1    | 154        | 997        |
| Total      | 336                  | 1142 | 51    | 1    | 1530       | 0                   | 655  | 410   | 8    | 1073       | 176                  | 522  | 0     | 0    | 698        | 0                  | 291  | 339   | 4    | 634        | 3935       |
| 09:00 AM   | 74                   | 262  | 8     | 0    | 344        | 0                   | 112  | 134   | 0    | 246        | 40                   | 152  | 0     | 0    | 192        | 0                  | 69   | 105   | 0    | 174        | 956        |
| 09:15 AM   | 63                   | 200  | 10    | 0    | 273        | 0                   | 124  | 142   | 3    | 269        | 35                   | 168  | 0     | 0    | 203        | 0                  | 72   | 82    | 1    | 155        | 900        |
| 09:30 AM   | 81                   | 231  | 12    | 0    | 324        | 0                   | 105  | 109   | 0    | 214        | 34                   | 127  | 0     | 0    | 161        | 0                  | 66   | 56    | 3    | 125        | 824        |
| 09:45 AM   | 79                   | 182  | 17    | 0    | 278        | 0                   | 108  | 107   | 0    | 215        | 31                   | 124  | 0     | 0    | 155        | 0                  | 68   | 77    | 5    | 150        | 798        |
| Total      | 297                  | 875  | 47    | 0    | 1219       | 0                   | 449  | 492   | 3    | 944        | 140                  | 571  | 0     | 0    | 711        | 0                  | 275  | 320   | 9    | 604        | 3478       |
| 10:00 AM   | 79                   | 170  | 12    | 0    | 261        | 0                   | 72   | 91    | 0    | 163        | 52                   | 161  | 0     | 0    | 213        | 0                  | 56   | 75    | 2    | 133        | 770        |
| 10:15 AM   | 65                   | 179  | 24    | 0    | 268        | 0                   | 83   | 94    | 2    | 179        | 44                   | 164  | 0     | 0    | 208        | 0                  | 62   | 52    | 0    | 114        | 769        |
| 10:30 AM   | 82                   | 163  | 9     | 0    | 254        | 0                   | 67   | 109   | 0    | 176        | 36                   | 147  | 0     | 0    | 183        | 0                  | 53   | 67    | 2    | 122        | 735        |
| 10:45 AM   | 87                   | 198  | 10    | 0    | 295        | 0                   | 76   | 117   | 3    | 196        | 42                   | 159  | 0     | 0    | 201        | 0                  | 68   | 78    | 0    | 146        | 838        |
| Total      | 313                  | 710  | 55    | 0    | 1078       | 0                   | 298  | 411   | 5    | 714        | 174                  | 631  | 0     | 0    | 805        | 0                  | 239  | 272   | 4    | 515        | 3112       |
| 11:00 AM   | 99                   | 199  | 11    | 0    | 309        | 0                   | 72   | 95    | 0    | 167        | 49                   | 169  | 0     | 0    | 218        | 0                  | 55   | 54    | 1    | 110        | 804        |
| 11:15 AM   | 98                   | 208  | 7     | 0    | 313        | 0                   | 87   | 88    | 2    | 177        | 46                   | 186  | 0     | 0    | 232        | 0                  | 57   | 75    | 3    | 135        | 857        |
| 11:30 AM   | 94                   | 204  | 15    | 0    | 313        | 0                   | 64   | 80    | 0    | 144        | 55                   | 204  | 0     | 0    | 259        | 0                  | 66   | 60    | 2    | 128        | 844        |
| 11:45 AM   | 70                   | 204  | 13    | 0    | 287        | 0                   | 67   | 113   | 1    | 181        | 61                   | 190  | 0     | 0    | 251        | 0                  | 62   | 77    | 4    | 143        | 862        |
| Total      | 361                  | 815  | 46    | 0    | 1222       | 0                   | 290  | 376   | 3    | 669        | 211                  | 749  | 0     | 0    | 960        | 0                  | 240  | 266   | 10   | 516        | 3367       |
| 12:00 PM   | 7                    | 22   | 1     | 0    | 30         | 0                   | 18   | 17    | 0    | 35         | 12                   | 31   | 0     | 0    | 43         | 0                  | 17   | 4     | 0    | 21         | 129        |
| 12:15 PM   | 76                   | 143  | 9     | 0    | 228        | 0                   | 49   | 85    | 0    | 134        | 49                   | 169  | 0     | 0    | 218        | 0                  | 44   | 42    | 3    | 89         | 669        |
| 12:30 PM   | 101                  | 232  | 15    | 0    | 348        | 0                   | 98   | 101   | 0    | 199        | 54                   | 213  | 0     | 0    | 267        | 0                  | 89   | 58    | 3    | 150        | 964        |
| 12:45 PM   | 97                   | 243  | 13    | 0    | 353        | 0                   | 71   | 92    | 0    | 163        | 66                   | 228  | 1     | 0    | 295        | 0                  | 80   | 58    | 2    | 140        | 951        |
| Total      | 281                  | 640  | 38    | 0    | 959        | 0                   | 236  | 295   | 0    | 531        | 181                  | 641  | 1     | 0    | 823        | 0                  | 230  | 162   | 8    | 400        | 2713       |
| 01:00 PM   | 111                  | 209  | 15    | 0    | 335        | 0                   | 94   | 84    | 1    | 179        | 54                   | 213  | 3     | 0    | 270        | 0                  | 74   | 50    | 4    | 128        | 912        |
| 01:15 PM   | 89                   | 198  | 18    | 0    | 305        | 0                   | 99   | 75    | 0    | 174        | 59                   | 205  | 1     | 0    | 265        | 0                  | 79   | 70    | 0    | 149        | 893        |
| 01:30 PM   | 100                  | 187  | 11    | 0    | 298        | 0                   | 84   | 84    | 3    | 171        | 63                   | 179  | 0     | 1    | 243        | 0                  | 55   | 61    | 0    | 116        | 828        |
| 01:45 PM   | 91                   | 198  | 13    | 0    | 302        | 0                   | 82   | 107   | 3    | 192        | 62                   | 230  | 0     | 0    | 292        | 0                  | 69   | 47    | 2    | 118        | 904        |
| Total      | 391                  | 792  | 57    | 0    | 1240       | 0                   | 359  | 350   | 7    | 716        | 238                  | 827  | 4     | 1    | 1070       | 0                  | 277  | 228   | 6    | 511        | 3537       |
| 02:00 PM   | 109                  | 220  | 19    | 0    | 348        | 0                   | 72   | 88    | 2    | 162        | 70                   | 204  | 0     | 0    | 274        | 0                  | 58   | 62    | 0    | 120        | 904        |
| 02:15 PM   | 111                  | 223  | 12    | 0    | 346        | 0                   | 94   | 71    | 0    | 165        | 64                   | 222  | 1     | 0    | 287        | 0                  | 104  | 65    | 3    | 172        | 970        |
| 02:30 PM   | 113                  | 188  | 14    | 0    | 315        | 0                   | 87   | 83    | 3    | 173        | 69                   | 260  | 0     | 0    | 329        | 0                  | 92   | 60    | 9    | 161        | 978        |

ATTACHMENT A

# MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045

443-741-3500

File Name : MD 355 AT MD 28-MD 586

Site Code : 00000000

Start Date : 9/20/2022

Page No : 2

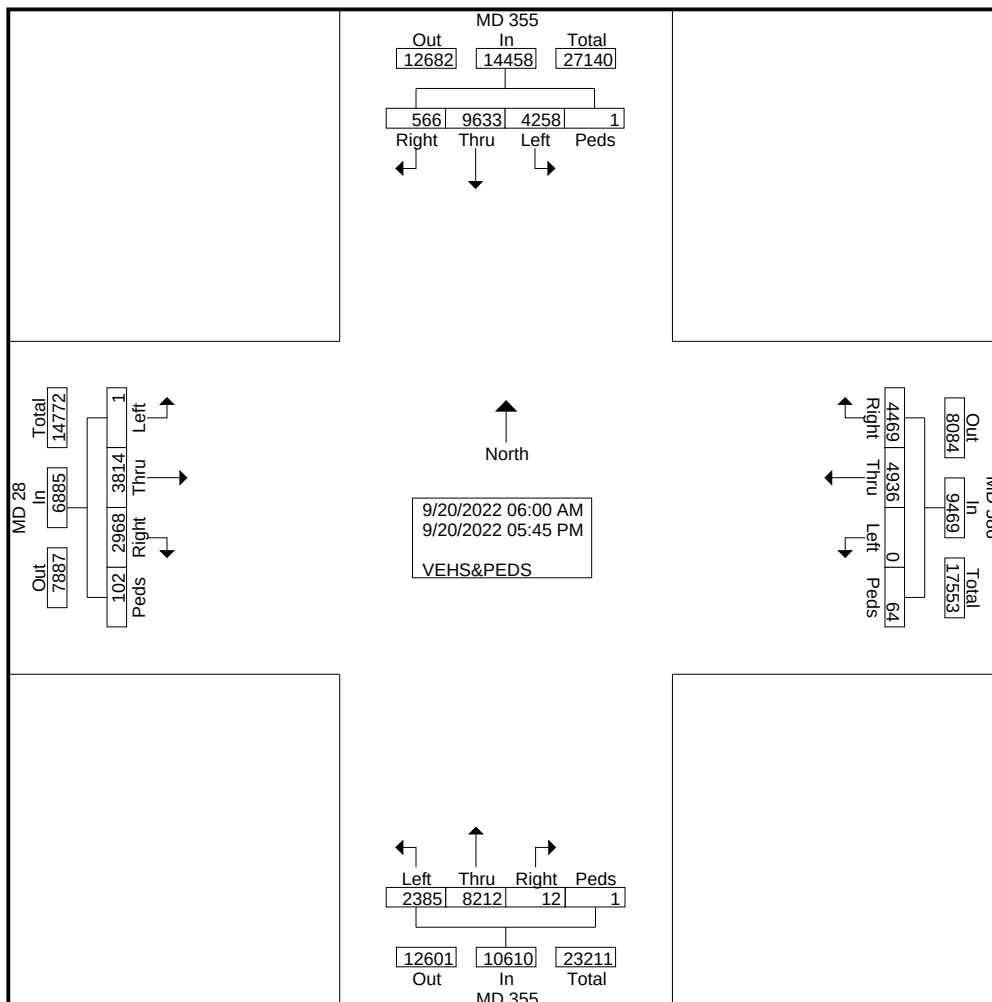
Groups Printed- VEHS&PEDS

|             | MD 355<br>From North |      |       |      |            | MD 586<br>From East |      |       |      |            | MD 355<br>From South |      |       |      |            | MD 28<br>From West |      |       |      |            |            |
|-------------|----------------------|------|-------|------|------------|---------------------|------|-------|------|------------|----------------------|------|-------|------|------------|--------------------|------|-------|------|------------|------------|
| Start Time  | Left                 | Thru | Right | Peds | App. Total | Left                | Thru | Right | Peds | App. Total | Left                 | Thru | Right | Peds | App. Total | Left               | Thru | Right | Peds | App. Total | Int. Total |
| 02:45 PM    | 105                  | 171  | 17    | 0    | 293        | 0                   | 91   | 121   | 3    | 215        | 69                   | 202  | 0     | 0    | 271        | 0                  | 102  | 63    | 2    | 167        | 946        |
| Total       | 438                  | 802  | 62    | 0    | 1302       | 0                   | 344  | 363   | 8    | 715        | 272                  | 888  | 1     | 0    | 1161       | 0                  | 356  | 250   | 14   | 620        | 3798       |
| 03:00 PM    | 108                  | 173  | 10    | 0    | 291        | 0                   | 84   | 134   | 3    | 221        | 56                   | 150  | 1     | 0    | 207        | 0                  | 85   | 56    | 4    | 145        | 864        |
| 03:15 PM    | 114                  | 149  | 10    | 0    | 273        | 0                   | 92   | 125   | 4    | 221        | 54                   | 176  | 0     | 0    | 230        | 0                  | 138  | 70    | 1    | 209        | 933        |
| 03:30 PM    | 124                  | 148  | 6     | 0    | 278        | 0                   | 131  | 121   | 2    | 254        | 67                   | 235  | 1     | 0    | 303        | 0                  | 102  | 47    | 4    | 153        | 988        |
| 03:45 PM    | 83                   | 148  | 10    | 0    | 241        | 0                   | 126  | 117   | 3    | 246        | 64                   | 256  | 1     | 0    | 321        | 0                  | 117  | 66    | 2    | 185        | 993        |
| Total       | 429                  | 618  | 36    | 0    | 1083       | 0                   | 433  | 497   | 12   | 942        | 241                  | 817  | 3     | 0    | 1061       | 0                  | 442  | 239   | 11   | 692        | 3778       |
| 04:00 PM    | 135                  | 218  | 17    | 0    | 370        | 0                   | 141  | 116   | 0    | 257        | 63                   | 257  | 0     | 0    | 320        | 0                  | 104  | 72    | 2    | 178        | 1125       |
| 04:15 PM    | 137                  | 207  | 11    | 0    | 355        | 0                   | 120  | 105   | 2    | 227        | 82                   | 256  | 1     | 0    | 339        | 0                  | 154  | 58    | 3    | 215        | 1136       |
| 04:30 PM    | 120                  | 216  | 13    | 0    | 349        | 0                   | 110  | 98    | 1    | 209        | 62                   | 261  | 1     | 0    | 324        | 0                  | 153  | 58    | 0    | 211        | 1093       |
| 04:45 PM    | 135                  | 206  | 13    | 0    | 354        | 0                   | 109  | 89    | 4    | 202        | 67                   | 256  | 0     | 0    | 323        | 0                  | 132  | 57    | 3    | 192        | 1071       |
| Total       | 527                  | 847  | 54    | 0    | 1428       | 0                   | 480  | 408   | 7    | 895        | 274                  | 1030 | 2     | 0    | 1306       | 0                  | 543  | 245   | 8    | 796        | 4425       |
| 05:00 PM    | 136                  | 215  | 17    | 0    | 368        | 0                   | 118  | 100   | 2    | 220        | 71                   | 259  | 0     | 0    | 330        | 0                  | 152  | 57    | 1    | 210        | 1128       |
| 05:15 PM    | 144                  | 210  | 18    | 0    | 372        | 0                   | 106  | 91    | 0    | 197        | 67                   | 227  | 0     | 0    | 294        | 0                  | 154  | 66    | 1    | 221        | 1084       |
| 05:30 PM    | 139                  | 201  | 20    | 0    | 360        | 0                   | 99   | 99    | 2    | 200        | 85                   | 228  | 1     | 0    | 314        | 1                  | 132  | 85    | 4    | 222        | 1096       |
| 05:45 PM    | 116                  | 193  | 12    | 0    | 321        | 0                   | 82   | 88    | 4    | 174        | 82                   | 270  | 0     | 0    | 352        | 0                  | 138  | 58    | 3    | 199        | 1046       |
| Total       | 535                  | 819  | 67    | 0    | 1421       | 0                   | 405  | 378   | 8    | 791        | 305                  | 984  | 1     | 0    | 1290       | 1                  | 576  | 266   | 9    | 852        | 4354       |
| Grand Total | 4258                 | 9633 | 566   | 1    | 14458      | 0                   | 4936 | 4469  | 64   | 9469       | 2385                 | 8212 | 12    | 1    | 10610      | 1                  | 3814 | 2968  | 102  | 6885       | 41422      |
| Apprch %    | 29.5                 | 66.6 | 3.9   | 0    |            | 0                   | 52.1 | 47.2  | 0.7  |            | 22.5                 | 77.4 | 0.1   | 0    |            | 0                  | 55.4 | 43.1  | 1.5  |            |            |
| Total %     | 10.3                 | 23.3 | 1.4   | 0    | 34.9       | 0                   | 11.9 | 10.8  | 0.2  | 22.9       | 5.8                  | 19.8 | 0     | 0    | 25.6       | 0                  | 9.2  | 7.2   | 0.2  | 16.6       |            |

ATTACHMENT A

**MEAD & HUNT**  
7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045  
*443-741-3500*

File Name : MD 355 AT MD 28-MD 586  
Site Code : 00000000  
Start Date : 9/20/2022  
Page No : 3



ATTACHMENT A

# MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045

443-741-3500

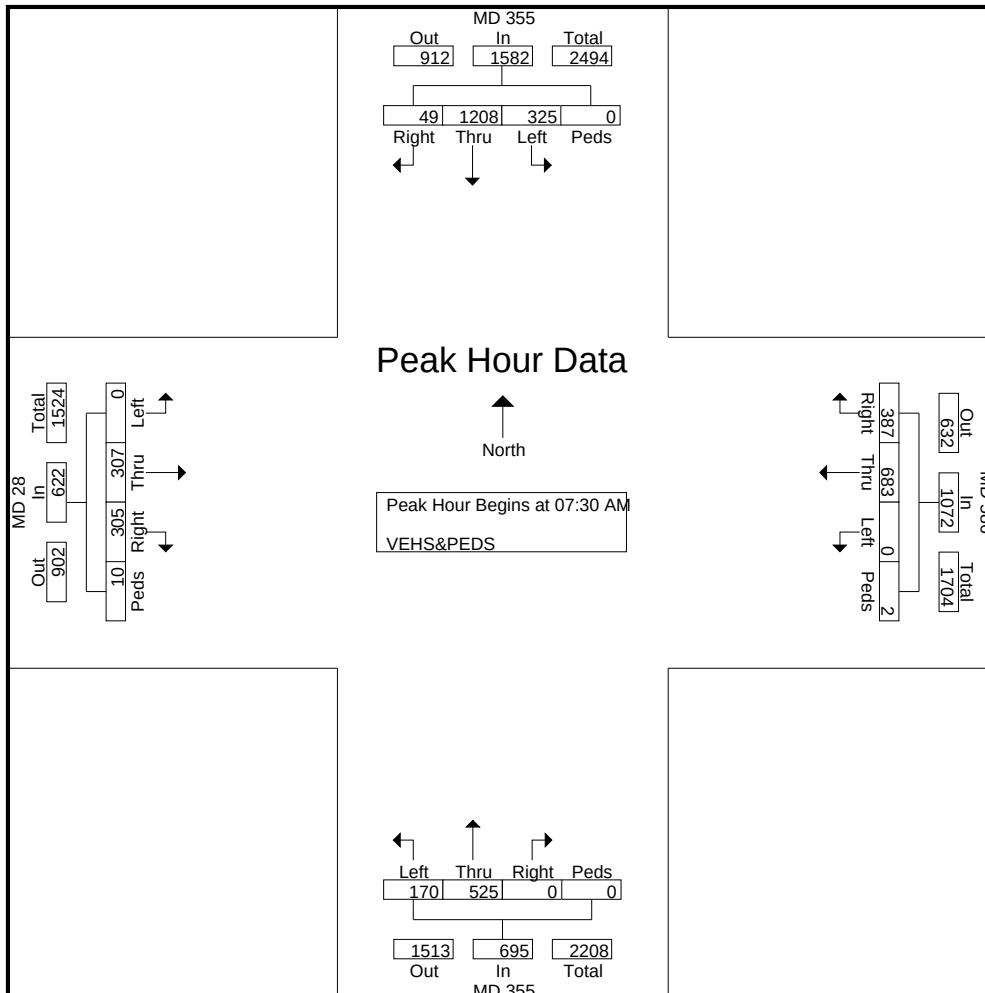
File Name : MD 355 AT MD 28-MD 586

Site Code : 00000000

Start Date : 9/20/2022

Page No : 4

|                                                            | MD 355<br>From North |      |       |      |            | MD 586<br>From East |      |       |      |            | MD 355<br>From South |      |       |      |            | MD 28<br>From West |      |       |      |            |            |
|------------------------------------------------------------|----------------------|------|-------|------|------------|---------------------|------|-------|------|------------|----------------------|------|-------|------|------------|--------------------|------|-------|------|------------|------------|
| Start Time                                                 | Left                 | Thru | Right | Peds | App. Total | Left                | Thru | Right | Peds | App. Total | Left                 | Thru | Right | Peds | App. Total | Left               | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1 |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:30 AM       |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| 07:30 AM                                                   | 66                   | 351  | 12    | 0    | 429        | 0                   | 162  | 87    | 0    | 249        | 43                   | 130  | 0     | 0    | 173        | 0                  | 65   | 64    | 5    | 134        | 985        |
| 07:45 AM                                                   | 78                   | 298  | 9     | 0    | 385        | 0                   | 173  | 122   | 0    | 295        | 41                   | 131  | 0     | 0    | 172        | 0                  | 75   | 83    | 2    | 160        | 1012       |
| 08:00 AM                                                   | 93                   | 296  | 10    | 0    | 399        | 0                   | 169  | 81    | 2    | 252        | 44                   | 128  | 0     | 0    | 172        | 0                  | 80   | 80    | 0    | 160        | 983        |
| 08:15 AM                                                   | 88                   | 263  | 18    | 0    | 369        | 0                   | 179  | 97    | 0    | 276        | 42                   | 136  | 0     | 0    | 178        | 0                  | 87   | 78    | 3    | 168        | 991        |
| Total Volume                                               | 325                  | 1208 | 49    | 0    | 1582       | 0                   | 683  | 387   | 2    | 1072       | 170                  | 525  | 0     | 0    | 695        | 0                  | 307  | 305   | 10   | 622        | 3971       |
| % App. Total                                               | 20.5                 | 76.4 | 3.1   | 0    |            | 0                   | 63.7 | 36.1  | 0.2  |            | 24.5                 | 75.5 | 0     | 0    |            | 0                  | 49.4 | 49    | 1.6  |            |            |
| PHF                                                        | .874                 | .860 | .681  | .000 | .922       | .000                | .954 | .793  | .250 | .908       | .966                 | .965 | .000  | .000 | .976       | .000               | .882 | .919  | .500 | .926       | .981       |



ATTACHMENT A

# MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045

443-741-3500

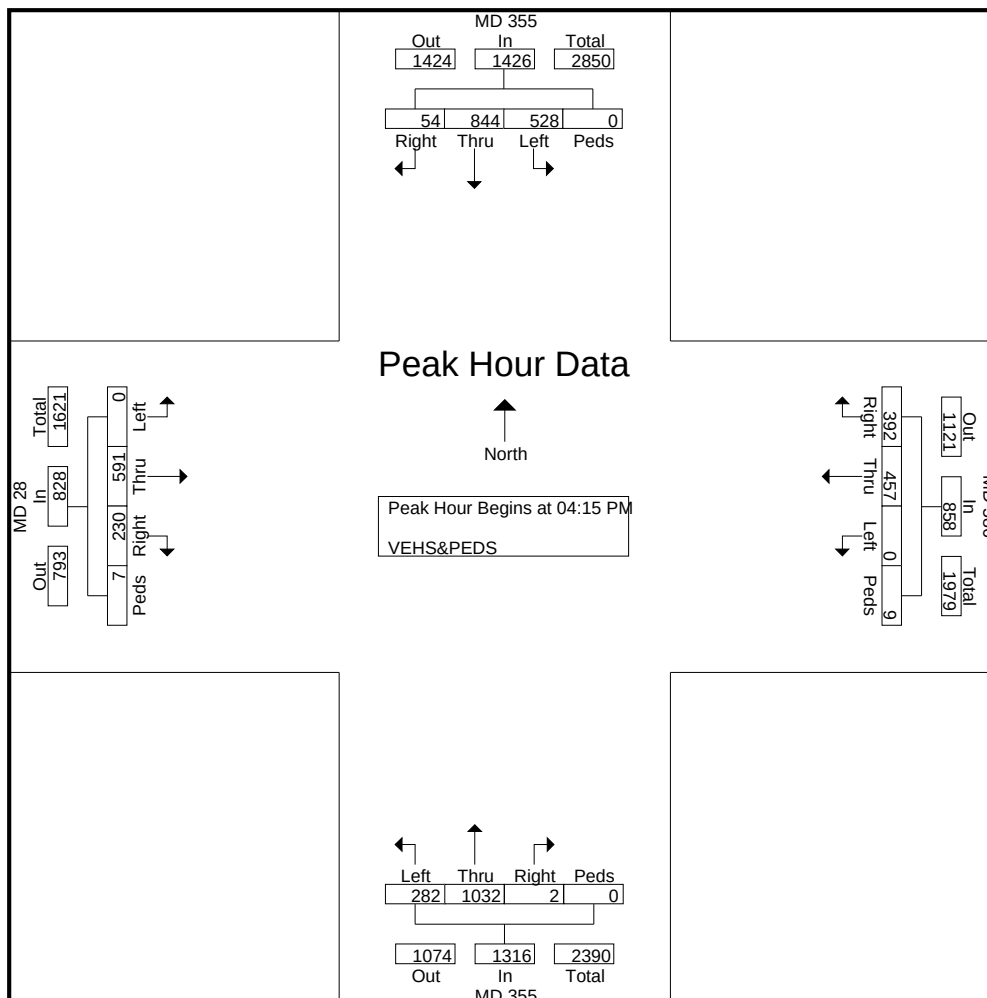
File Name : MD 355 AT MD 28-MD 586

Site Code : 00000000

Start Date : 9/20/2022

Page No : 5

|                                                            | MD 355<br>From North |      |       |      |            | MD 586<br>From East |      |       |      |            | MD 355<br>From South |      |       |      |            | MD 28<br>From West |      |       |      |            |            |
|------------------------------------------------------------|----------------------|------|-------|------|------------|---------------------|------|-------|------|------------|----------------------|------|-------|------|------------|--------------------|------|-------|------|------------|------------|
| Start<br>Time                                              | Left                 | Thru | Right | Peds | App. Total | Left                | Thru | Right | Peds | App. Total | Left                 | Thru | Right | Peds | App. Total | Left               | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1 |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 04:15 PM       |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| 04:15 PM                                                   | 137                  | 207  | 11    | 0    | 355        | 0                   | 120  | 105   | 2    | 227        | 82                   | 256  | 1     | 0    | 339        | 0                  | 154  | 58    | 3    | 215        | 1136       |
| 04:30 PM                                                   | 120                  | 216  | 13    | 0    | 349        | 0                   | 110  | 98    | 1    | 209        | 62                   | 261  | 1     | 0    | 324        | 0                  | 153  | 58    | 0    | 211        | 1093       |
| 04:45 PM                                                   | 135                  | 206  | 13    | 0    | 354        | 0                   | 109  | 89    | 4    | 202        | 67                   | 256  | 0     | 0    | 323        | 0                  | 132  | 57    | 3    | 192        | 1071       |
| 05:00 PM                                                   | 136                  | 215  | 17    | 0    | 368        | 0                   | 118  | 100   | 2    | 220        | 71                   | 259  | 0     | 0    | 330        | 0                  | 152  | 57    | 1    | 210        | 1128       |
| Total Volume                                               | 528                  | 844  | 54    | 0    | 1426       | 0                   | 457  | 392   | 9    | 858        | 282                  | 1032 | 2     | 0    | 1316       | 0                  | 591  | 230   | 7    | 828        | 4428       |
| % App. Total                                               | 37                   | 59.2 | 3.8   | 0    |            | 0                   | 53.3 | 45.7  | 1    |            | 21.4                 | 78.4 | 0.2   | 0    |            | 0                  | 71.4 | 27.8  | 0.8  |            |            |
| PHF                                                        | .964                 | .977 | .794  | .000 | .969       | .000                | .952 | .933  | .563 | .945       | .860                 | .989 | .500  | .000 | .971       | .000               | .959 | .991  | .583 | .963       | .974       |





**MEAD & HUNT**7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045

443-741-3500

Weather:  
Counted By:  
Town:  
Country:File Name : MD 355 AT MD 28-MD 586  
Site Code : 00000000  
Start Date : 9/20/2022  
Page No : 1

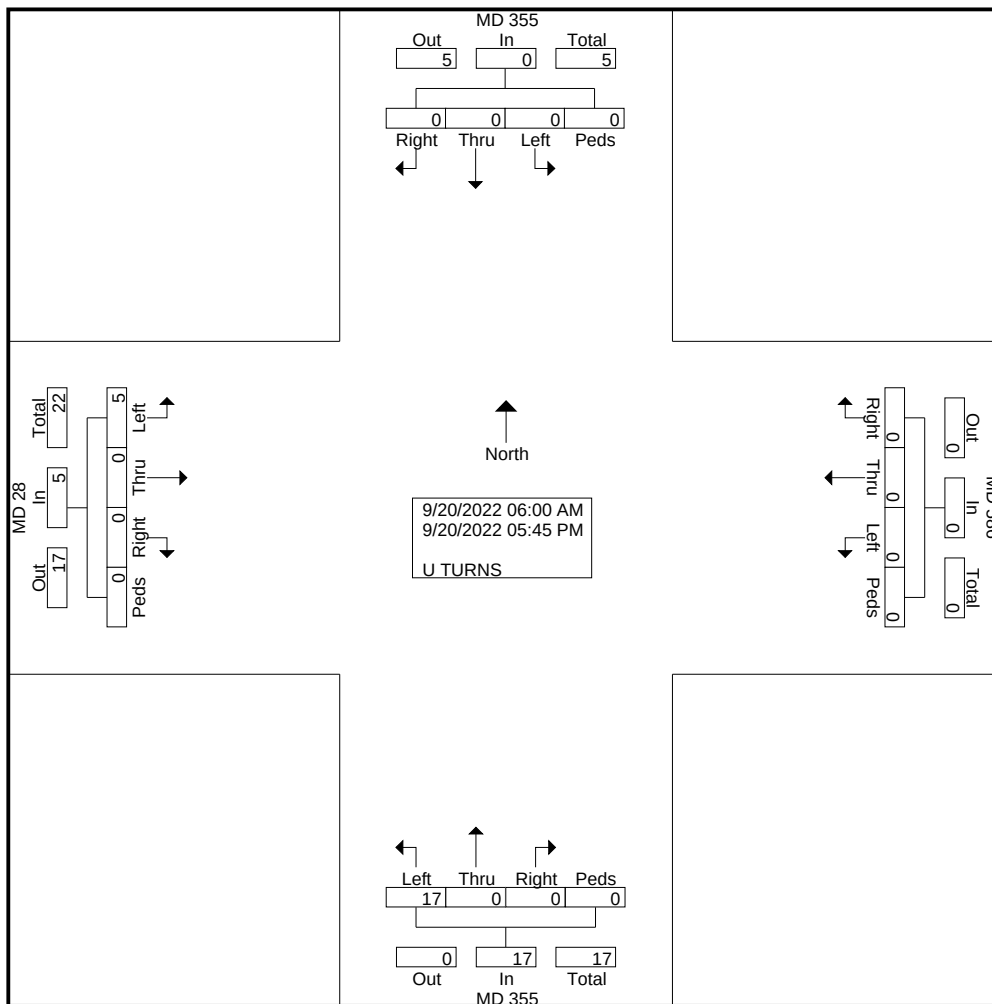
## Groups Printed- U TURNS

|               | MD 355<br>From North |      |       |      |            | MD 586<br>From East |      |       |      |            | MD 355<br>From South |      |       |      |            | MD 28<br>From West |      |       |      |            |            |
|---------------|----------------------|------|-------|------|------------|---------------------|------|-------|------|------------|----------------------|------|-------|------|------------|--------------------|------|-------|------|------------|------------|
| Start Time    | Left                 | Thru | Right | Peds | App. Total | Left                | Thru | Right | Peds | App. Total | Left                 | Thru | Right | Peds | App. Total | Left               | Thru | Right | Peds | App. Total | Int. Total |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| 07:15 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 1                  | 0    | 0     | 0    | 1          | 2          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 1                  | 0    | 0     | 0    | 1          | 2          |
| 08:00 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 2                  | 0    | 0     | 0    | 2          | 2          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 2                  | 0    | 0     | 0    | 2          | 2          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| 09:30 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| 10:00 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| 10:15 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| 10:30 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 2                    | 0    | 0     | 0    | 2          | 0                  | 0    | 0     | 0    | 0          | 2          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 4                    | 0    | 0     | 0    | 4          | 0                  | 0    | 0     | 0    | 0          | 4          |
| 11:00 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 1                  | 0    | 0     | 0    | 1          | 1          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| 11:30 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 1                  | 0    | 0     | 0    | 1          | 1          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 2                  | 0    | 0     | 0    | 2          | 2          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| 12:30 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| 01:00 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 2                    | 0    | 0     | 0    | 2          | 0                  | 0    | 0     | 0    | 0          | 2          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| 01:45 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 3                    | 0    | 0     | 0    | 3          | 0                  | 0    | 0     | 0    | 0          | 3          |
| 02:00 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 2                    | 0    | 0     | 0    | 2          | 0                  | 0    | 0     | 0    | 0          | 2          |
| 02:15 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| 02:30 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 2                    | 0    | 0     | 0    | 2          | 0                  | 0    | 0     | 0    | 0          | 2          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 5                    | 0    | 0     | 0    | 5          | 0                  | 0    | 0     | 0    | 0          | 5          |
| 03:00 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| 03:15 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 1                    | 0    | 0     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 2                    | 0    | 0     | 0    | 2          | 0                  | 0    | 0     | 0    | 0          | 2          |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| Grand Total   | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 17                   | 0    | 0     | 0    | 17         | 5                  | 0    | 0     | 0    | 5          | 22         |
| Apprch %      | 0                    | 0    | 0     | 0    |            | 0                   | 0    | 0     | 0    |            | 100                  | 0    | 0     | 0    |            | 100                | 0    | 0     | 0    |            |            |
| Total %       | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 77.3                 | 0    | 0     | 0    | 77.3       | 22.7               | 0    | 0     | 0    | 22.7       |            |

ATTACHMENT A

**MEAD & HUNT**  
7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045  
*443-741-3500*

File Name : MD 355 AT MD 28-MD 586  
Site Code : 00000000  
Start Date : 9/20/2022  
Page No : 2



**MEAD & HUNT**7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045

443-741-3500

Weather:  
Counted By:  
Town:  
Country:File Name : MD 355 AT MD 28-MD 586  
Site Code : 00000000  
Start Date : 9/20/2022  
Page No : 1

## Groups Printed- BICYCLES

|               | MD 355<br>From North |      |       |      |            | MD 586<br>From East |      |       |      |            | MD 355<br>From South |      |       |      |            | MD 28<br>From West |      |       |      |            |            |   |
|---------------|----------------------|------|-------|------|------------|---------------------|------|-------|------|------------|----------------------|------|-------|------|------------|--------------------|------|-------|------|------------|------------|---|
| Start Time    | Left                 | Thru | Right | Peds | App. Total | Left                | Thru | Right | Peds | App. Total | Left                 | Thru | Right | Peds | App. Total | Left               | Thru | Right | Peds | App. Total | Int. Total |   |
| 06:00 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| 06:15 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 1     | 0    | 0          | 1          | 2 |
| 06:30 AM      | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| 06:45 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 1 |
| Total         | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 2    | 2          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 1     | 0    | 1          | 2          | 5 |
| 07:00 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 1 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| 07:30 AM      | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| Total         | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 2 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| 08:15 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 2    | 2          | 2          | 2 |
| 08:30 AM      | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| 08:45 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| Total         | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 2    | 2          | 2          | 4 |
| 09:00 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 2    | 0     | 0    | 2          | 2          | 2 |
| 09:15 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 2 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 2    | 0     | 1    | 3          | 3          | 4 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| 10:30 AM      | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 3 |
| 10:45 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| Total         | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 2    | 2          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 4 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| 11:15 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 1 |
| 11:30 AM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 1 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 2    | 2          | 2          | 2 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| 12:45 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 1 |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 1 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| 01:15 PM      | 1                    | 0    | 0     | 0    | 1          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| 01:45 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| Total         | 1                    | 0    | 0     | 0    | 1          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 2 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| 02:15 PM      | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |   |
| Total         | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 0          | 1 |
| 03:00 PM      | 0                    | 0    | 1     | 0    | 1          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          | 2 |
| 03:15 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 3    | 3          | 3          | 3 |

ATTACHMENT A

# MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045

443-741-3500

File Name : MD 355 AT MD 28-MD 586

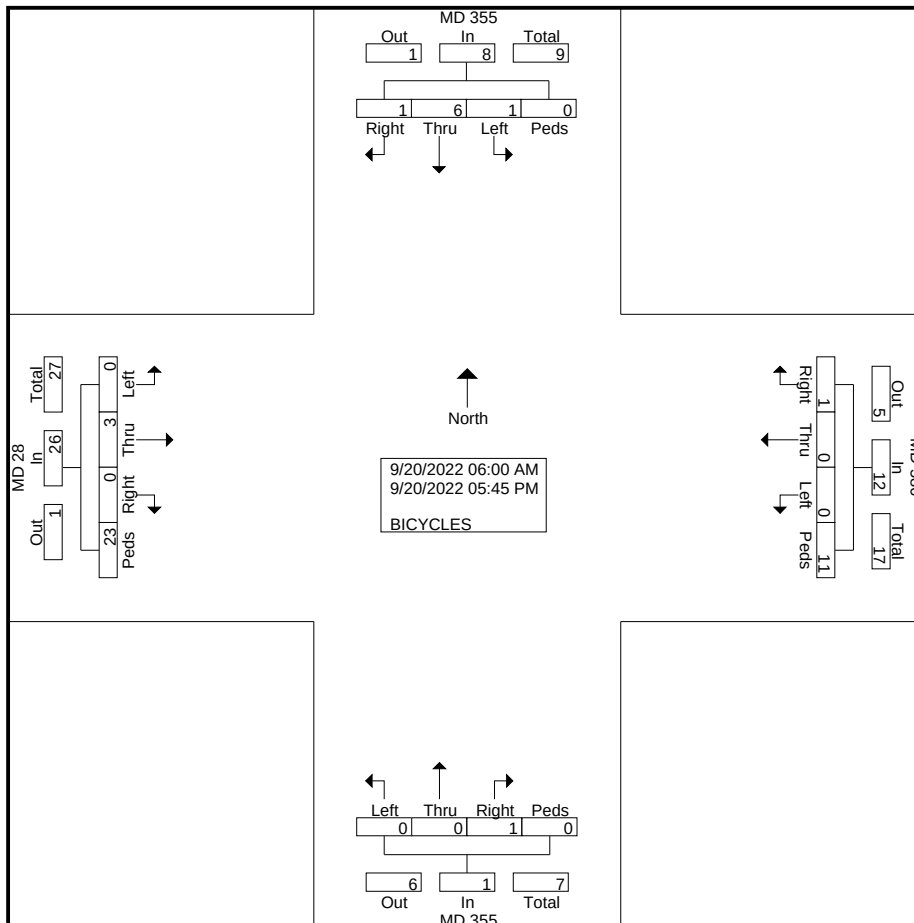
Site Code : 00000000

Start Date : 9/20/2022

Page No : 2

Groups Printed- BICYCLES

|               | MD 355<br>From North |      |       |      |            | MD 586<br>From East |      |       |      |            | MD 355<br>From South |      |       |      |            | MD 28<br>From West |      |       |      |            |            |
|---------------|----------------------|------|-------|------|------------|---------------------|------|-------|------|------------|----------------------|------|-------|------|------------|--------------------|------|-------|------|------------|------------|
| Start Time    | Left                 | Thru | Right | Peds | App. Total | Left                | Thru | Right | Peds | App. Total | Left                 | Thru | Right | Peds | App. Total | Left               | Thru | Right | Peds | App. Total | Int. Total |
| 03:30 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 2    | 2          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 3          |
| 03:45 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 2    | 2          | 3          |
| Total         | 0                    | 0    | 1     | 0    | 1          | 0                   | 0    | 0     | 3    | 3          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 7    | 7          | 11         |
| *** BREAK *** |                      |      |       |      |            |                     |      |       |      |            |                      |      |       |      |            |                    |      |       |      |            |            |
| 04:15 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          |
| 04:30 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 3    | 3          | 4          |
| 04:45 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          |
| Total         | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 1    | 1          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 5    | 5          | 6          |
| 05:00 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          |
| 05:15 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 1    | 1          | 1          |
| 05:30 PM      | 0                    | 0    | 0     | 0    | 0          | 0                   | 0    | 1     | 0    | 1          | 0                    | 0    | 1     | 0    | 1          | 0                  | 0    | 0     | 0    | 0          | 2          |
| 05:45 PM      | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 0     | 0    | 0          | 0                    | 0    | 0     | 0    | 0          | 0                  | 0    | 0     | 0    | 0          | 1          |
| Total         | 0                    | 1    | 0     | 0    | 1          | 0                   | 0    | 1     | 0    | 1          | 0                    | 0    | 1     | 0    | 1          | 0                  | 0    | 0     | 2    | 2          | 5          |
| Grand Total   | 1                    | 6    | 1     | 0    | 8          | 0                   | 0    | 1     | 11   | 12         | 0                    | 0    | 1     | 0    | 1          | 0                  | 3    | 0     | 23   | 26         | 47         |
| Apprch %      | 12.5                 | 75   | 12.5  | 0    |            | 0                   | 0    | 8.3   | 91.7 |            | 0                    | 0    | 100   | 0    |            | 0                  | 11.5 | 0     | 88.5 |            |            |
| Total %       | 2.1                  | 12.8 | 2.1   | 0    | 17         | 0                   | 0    | 2.1   | 23.4 | 25.5       | 0                    | 0    | 2.1   | 0    | 2.1        | 0                  | 6.4  | 0     | 48.9 | 55.3       |            |



ATTACHMENT A

**MEAD & HUNT**

7055 Samuel Morse Dr. Ste. 100  
Columbia, Maryland 21045

*443-741-3500*

ATTACHMENT A

**Mead & Hunt**  
7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

Weather:  
Counted By:  
Town:  
Country

File Name : MONROE ST AT JEFFERSON ST  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 1

Groups Printed- VEHS&PEDS

| Start Time | MONROE ST<br>From North |      |       |      |            | JEFFERSON ST<br>From East |      |       |      |            | MONROE ST<br>From South |      |       |      |            | JEFFERSON ST<br>From West |      |       |      |            | Int. Total |
|------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
|            | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total |            |
| 06:00 AM   | 2                       | 3    | 4     | 0    | 9          | 2                         | 74   | 2     | 2    | 80         | 0                       | 7    | 4     | 1    | 12         | 1                         | 25   | 1     | 1    | 28         | 129        |
| 06:15 AM   | 2                       | 5    | 7     | 1    | 15         | 9                         | 84   | 1     | 2    | 96         | 4                       | 11   | 8     | 0    | 23         | 5                         | 30   | 2     | 1    | 38         | 172        |
| 06:30 AM   | 4                       | 8    | 2     | 0    | 14         | 6                         | 102  | 3     | 4    | 115        | 0                       | 10   | 6     | 0    | 16         | 5                         | 37   | 1     | 5    | 48         | 193        |
| 06:45 AM   | 3                       | 8    | 3     | 0    | 14         | 9                         | 102  | 12    | 10   | 133        | 2                       | 13   | 15    | 0    | 30         | 9                         | 65   | 6     | 2    | 82         | 259        |
| Total      | 11                      | 24   | 16    | 1    | 52         | 26                        | 362  | 18    | 18   | 424        | 6                       | 41   | 33    | 1    | 81         | 20                        | 157  | 10    | 9    | 196        | 753        |
| 07:00 AM   | 2                       | 10   | 10    | 2    | 24         | 11                        | 113  | 6     | 6    | 136        | 4                       | 20   | 13    | 0    | 37         | 7                         | 91   | 5     | 3    | 106        | 303        |
| 07:15 AM   | 3                       | 17   | 13    | 2    | 35         | 22                        | 161  | 7     | 13   | 203        | 4                       | 21   | 12    | 2    | 39         | 13                        | 137  | 9     | 5    | 164        | 441        |
| 07:30 AM   | 3                       | 26   | 12    | 1    | 42         | 23                        | 174  | 6     | 30   | 233        | 29                      | 28   | 18    | 3    | 78         | 18                        | 155  | 25    | 7    | 205        | 558        |
| 07:45 AM   | 4                       | 15   | 13    | 2    | 34         | 24                        | 171  | 18    | 9    | 222        | 30                      | 42   | 13    | 4    | 89         | 22                        | 136  | 17    | 19   | 194        | 539        |
| Total      | 12                      | 68   | 48    | 7    | 135        | 80                        | 619  | 37    | 58   | 794        | 67                      | 111  | 56    | 9    | 243        | 60                        | 519  | 56    | 34   | 669        | 1841       |
| 08:00 AM   | 2                       | 23   | 8     | 4    | 37         | 23                        | 161  | 14    | 11   | 209        | 6                       | 25   | 15    | 4    | 50         | 22                        | 138  | 15    | 21   | 196        | 492        |
| 08:15 AM   | 6                       | 14   | 8     | 1    | 29         | 26                        | 168  | 18    | 9    | 221        | 5                       | 40   | 25    | 5    | 75         | 7                         | 139  | 7     | 19   | 172        | 497        |
| 08:30 AM   | 5                       | 16   | 19    | 2    | 42         | 33                        | 151  | 10    | 10   | 204        | 6                       | 33   | 11    | 17   | 67         | 14                        | 115  | 17    | 35   | 181        | 494        |
| 08:45 AM   | 8                       | 12   | 15    | 5    | 40         | 30                        | 158  | 13    | 12   | 213        | 9                       | 29   | 24    | 7    | 69         | 16                        | 146  | 12    | 26   | 200        | 522        |
| Total      | 21                      | 65   | 50    | 12   | 148        | 112                       | 638  | 55    | 42   | 847        | 26                      | 127  | 75    | 33   | 261        | 59                        | 538  | 51    | 101  | 749        | 2005       |
| 09:00 AM   | 5                       | 17   | 12    | 0    | 34         | 33                        | 138  | 16    | 1    | 188        | 12                      | 35   | 18    | 28   | 93         | 23                        | 142  | 19    | 24   | 208        | 523        |
| 09:15 AM   | 7                       | 14   | 8     | 4    | 33         | 26                        | 145  | 11    | 9    | 191        | 14                      | 44   | 19    | 9    | 86         | 18                        | 135  | 14    | 27   | 194        | 504        |
| 09:30 AM   | 4                       | 16   | 10    | 2    | 32         | 13                        | 146  | 13    | 4    | 176        | 5                       | 19   | 23    | 7    | 54         | 14                        | 115  | 11    | 11   | 151        | 413        |
| 09:45 AM   | 10                      | 12   | 10    | 1    | 33         | 15                        | 157  | 5     | 5    | 182        | 11                      | 17   | 17    | 8    | 53         | 16                        | 120  | 12    | 11   | 159        | 427        |
| Total      | 26                      | 59   | 40    | 7    | 132        | 87                        | 586  | 45    | 19   | 737        | 42                      | 115  | 77    | 52   | 286        | 71                        | 512  | 56    | 73   | 712        | 1867       |
| 10:00 AM   | 4                       | 9    | 14    | 5    | 32         | 12                        | 107  | 13    | 9    | 141        | 4                       | 18   | 23    | 9    | 54         | 9                         | 87   | 15    | 8    | 119        | 346        |
| 10:15 AM   | 3                       | 8    | 11    | 3    | 25         | 12                        | 108  | 10    | 11   | 141        | 8                       | 15   | 13    | 6    | 42         | 12                        | 109  | 7     | 12   | 140        | 348        |
| 10:30 AM   | 6                       | 11   | 18    | 0    | 35         | 5                         | 99   | 9     | 6    | 119        | 5                       | 21   | 7     | 7    | 40         | 8                         | 109  | 2     | 9    | 128        | 322        |
| 10:45 AM   | 5                       | 6    | 14    | 1    | 26         | 15                        | 122  | 7     | 5    | 149        | 5                       | 23   | 15    | 9    | 52         | 9                         | 122  | 15    | 11   | 157        | 384        |
| Total      | 18                      | 34   | 57    | 9    | 118        | 44                        | 436  | 39    | 31   | 550        | 22                      | 77   | 58    | 31   | 188        | 38                        | 427  | 39    | 40   | 544        | 1400       |
| 11:00 AM   | 4                       | 6    | 13    | 3    | 26         | 15                        | 104  | 4     | 12   | 135        | 7                       | 20   | 15    | 4    | 46         | 8                         | 94   | 6     | 6    | 114        | 321        |
| 11:15 AM   | 16                      | 12   | 8     | 3    | 39         | 10                        | 106  | 6     | 31   | 153        | 7                       | 15   | 11    | 11   | 44         | 9                         | 89   | 8     | 16   | 122        | 358        |
| 11:30 AM   | 9                       | 17   | 14    | 2    | 42         | 8                         | 108  | 10    | 53   | 179        | 6                       | 18   | 15    | 21   | 60         | 13                        | 103  | 11    | 15   | 142        | 423        |
| 11:45 AM   | 8                       | 16   | 17    | 9    | 50         | 12                        | 121  | 7     | 46   | 186        | 6                       | 21   | 17    | 11   | 55         | 10                        | 102  | 9     | 11   | 132        | 423        |
| Total      | 37                      | 51   | 52    | 17   | 157        | 45                        | 439  | 27    | 142  | 653        | 26                      | 74   | 58    | 47   | 205        | 40                        | 388  | 34    | 48   | 510        | 1525       |
| 12:00 PM   | 4                       | 17   | 8     | 6    | 35         | 16                        | 131  | 8     | 55   | 210        | 10                      | 25   | 14    | 11   | 60         | 13                        | 116  | 5     | 10   | 144        | 449        |
| 12:15 PM   | 10                      | 10   | 23    | 11   | 54         | 15                        | 115  | 7     | 27   | 164        | 8                       | 24   | 19    | 10   | 61         | 13                        | 125  | 6     | 21   | 165        | 444        |
| 12:30 PM   | 10                      | 11   | 21    | 4    | 46         | 16                        | 139  | 9     | 18   | 182        | 17                      | 24   | 22    | 9    | 72         | 8                         | 100  | 10    | 14   | 132        | 432        |
| 12:45 PM   | 1                       | 13   | 12    | 5    | 31         | 15                        | 137  | 12    | 22   | 186        | 12                      | 17   | 17    | 15   | 61         | 14                        | 111  | 7     | 25   | 157        | 435        |
| Total      | 25                      | 51   | 64    | 26   | 166        | 62                        | 522  | 36    | 122  | 742        | 47                      | 90   | 72    | 45   | 254        | 48                        | 452  | 28    | 70   | 598        | 1760       |
| 01:00 PM   | 8                       | 23   | 18    | 0    | 49         | 15                        | 130  | 8     | 7    | 160        | 13                      | 30   | 17    | 8    | 68         | 7                         | 108  | 8     | 12   | 135        | 412        |
| 01:15 PM   | 5                       | 15   | 19    | 3    | 42         | 21                        | 116  | 5     | 5    | 147        | 7                       | 19   | 19    | 12   | 57         | 9                         | 122  | 6     | 9    | 146        | 392        |
| 01:30 PM   | 9                       | 19   | 21    | 1    | 50         | 18                        | 129  | 4     | 5    | 156        | 13                      | 20   | 22    | 6    | 61         | 14                        | 102  | 10    | 11   | 137        | 404        |
| 01:45 PM   | 6                       | 12   | 19    | 6    | 43         | 10                        | 122  | 10    | 13   | 155        | 14                      | 18   | 29    | 6    | 67         | 10                        | 100  | 7     | 11   | 128        | 393        |
| Total      | 28                      | 69   | 77    | 10   | 184        | 64                        | 497  | 27    | 30   | 618        | 47                      | 87   | 87    | 32   | 253        | 40                        | 432  | 31    | 43   | 546        | 1601       |
| 02:00 PM   | 7                       | 10   | 13    | 4    | 34         | 9                         | 126  | 7     | 8    | 150        | 5                       | 14   | 16    | 7    | 42         | 5                         | 115  | 13    | 12   | 145        | 371        |
| 02:15 PM   | 4                       | 16   | 16    | 1    | 37         | 11                        | 134  | 2     | 4    | 151        | 11                      | 16   | 17    | 4    | 48         | 18                        | 119  | 11    | 10   | 158        | 394        |
| 02:30 PM   | 4                       | 15   | 16    | 7    | 42         | 12                        | 144  | 7     | 73   | 236        | 36                      | 22   | 13    | 43   | 114        | 11                        | 170  | 14    | 17   | 212        | 604        |
| 02:45 PM   | 6                       | 18   | 20    | 1    | 45         | 14                        | 167  | 10    | 37   | 228        | 19                      | 28   | 26    | 7    | 80         | 11                        | 135  | 12    | 14   | 172        | 525        |
| Total      | 21                      | 59   | 65    | 13   | 158        | 46                        | 571  | 26    | 122  | 765        | 71                      | 80   | 72    | 61   | 284        | 45                        | 539  | 50    | 53   | 687        | 1894       |

ATTACHMENT A

**Mead & Hunt**

7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

File Name : MONROE ST AT JEFFERSON ST  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 2

Groups Printed- VEHS&PEDS

|             | MONROE ST<br>From North |      |       |      |            | JEFFERSON ST<br>From East |      |       |      |            | MONROE ST<br>From South |      |       |      |            | JEFFERSON ST<br>From West |      |       |      |            |            |
|-------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
| Start Time  | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Int. Total |
| 03:00 PM    | 10                      | 15   | 15    | 6    | 46         | 12                        | 134  | 9     | 15   | 170        | 9                       | 24   | 29    | 6    | 68         | 11                        | 170  | 5     | 8    | 194        | 478        |
| 03:15 PM    | 8                       | 12   | 10    | 1    | 31         | 11                        | 149  | 11    | 17   | 188        | 10                      | 20   | 27    | 3    | 60         | 7                         | 178  | 9     | 13   | 207        | 486        |
| 03:30 PM    | 9                       | 15   | 20    | 8    | 52         | 12                        | 153  | 11    | 14   | 190        | 5                       | 22   | 17    | 5    | 49         | 10                        | 143  | 6     | 10   | 169        | 460        |
| 03:45 PM    | 6                       | 14   | 29    | 10   | 59         | 7                         | 162  | 13    | 17   | 199        | 15                      | 25   | 36    | 8    | 84         | 13                        | 139  | 5     | 13   | 170        | 512        |
| Total       | 33                      | 56   | 74    | 25   | 188        | 42                        | 598  | 44    | 63   | 747        | 39                      | 91   | 109   | 22   | 261        | 41                        | 630  | 25    | 44   | 740        | 1936       |
| 04:00 PM    | 13                      | 25   | 13    | 4    | 55         | 14                        | 154  | 6     | 10   | 184        | 15                      | 25   | 32    | 7    | 79         | 13                        | 143  | 12    | 12   | 180        | 498        |
| 04:15 PM    | 8                       | 25   | 21    | 7    | 61         | 14                        | 191  | 10    | 14   | 229        | 11                      | 27   | 32    | 13   | 83         | 8                         | 176  | 10    | 18   | 212        | 585        |
| 04:30 PM    | 24                      | 26   | 27    | 4    | 81         | 10                        | 173  | 6     | 10   | 199        | 14                      | 38   | 40    | 9    | 101        | 12                        | 209  | 10    | 26   | 257        | 638        |
| 04:45 PM    | 14                      | 25   | 18    | 2    | 59         | 16                        | 153  | 10    | 13   | 192        | 17                      | 30   | 45    | 5    | 97         | 10                        | 161  | 8     | 7    | 186        | 534        |
| Total       | 59                      | 101  | 79    | 17   | 256        | 54                        | 671  | 32    | 47   | 804        | 57                      | 120  | 149   | 34   | 360        | 43                        | 689  | 40    | 63   | 835        | 2255       |
| 05:00 PM    | 11                      | 22   | 31    | 2    | 66         | 9                         | 152  | 8     | 11   | 180        | 19                      | 19   | 46    | 1    | 85         | 11                        | 186  | 12    | 30   | 239        | 570        |
| 05:15 PM    | 13                      | 24   | 20    | 0    | 57         | 18                        | 174  | 6     | 15   | 213        | 15                      | 19   | 52    | 4    | 90         | 14                        | 188  | 7     | 14   | 223        | 583        |
| 05:30 PM    | 14                      | 21   | 20    | 5    | 60         | 14                        | 190  | 14    | 12   | 230        | 13                      | 30   | 42    | 2    | 87         | 8                         | 197  | 7     | 10   | 222        | 599        |
| 05:45 PM    | 8                       | 18   | 21    | 3    | 50         | 12                        | 156  | 10    | 16   | 194        | 14                      | 32   | 39    | 4    | 89         | 11                        | 155  | 8     | 11   | 185        | 518        |
| Total       | 46                      | 85   | 92    | 10   | 233        | 53                        | 672  | 38    | 54   | 817        | 61                      | 100  | 179   | 11   | 351        | 44                        | 726  | 34    | 65   | 869        | 2270       |
| 06:00 PM    | 6                       | 28   | 14    | 4    | 52         | 11                        | 141  | 10    | 10   | 172        | 13                      | 17   | 27    | 4    | 61         | 9                         | 157  | 4     | 9    | 179        | 464        |
| 06:15 PM    | 13                      | 22   | 15    | 1    | 51         | 16                        | 156  | 10    | 18   | 200        | 13                      | 29   | 23    | 1    | 66         | 6                         | 142  | 4     | 12   | 164        | 481        |
| 06:30 PM    | 6                       | 17   | 17    | 4    | 44         | 9                         | 145  | 15    | 16   | 185        | 10                      | 17   | 15    | 1    | 43         | 12                        | 140  | 10    | 7    | 169        | 441        |
| 06:45 PM    | 5                       | 11   | 11    | 2    | 29         | 6                         | 153  | 12    | 5    | 176        | 14                      | 23   | 30    | 0    | 67         | 4                         | 138  | 7     | 2    | 151        | 423        |
| Total       | 30                      | 78   | 57    | 11   | 176        | 42                        | 595  | 47    | 49   | 733        | 50                      | 86   | 95    | 6    | 237        | 31                        | 577  | 25    | 30   | 663        | 1809       |
| Grand Total | 367                     | 800  | 771   | 165  | 2103       | 757                       | 7206 | 471   | 797  | 9231       | 561                     | 1199 | 1120  | 384  | 3264       | 580                       | 6586 | 479   | 673  | 8318       | 22916      |
| Apprch %    | 17.5                    | 38   | 36.7  | 7.8  |            | 8.2                       | 78.1 | 5.1   | 8.6  |            | 17.2                    | 36.7 | 34.3  | 11.8 |            | 7                         | 79.2 | 5.8   | 8.1  |            |            |
| Total %     | 1.6                     | 3.5  | 3.4   | 0.7  | 9.2        | 3.3                       | 31.4 | 2.1   | 3.5  | 40.3       | 2.4                     | 5.2  | 4.9   | 1.7  | 14.2       | 2.5                       | 28.7 | 2.1   | 2.9  | 36.3       |            |

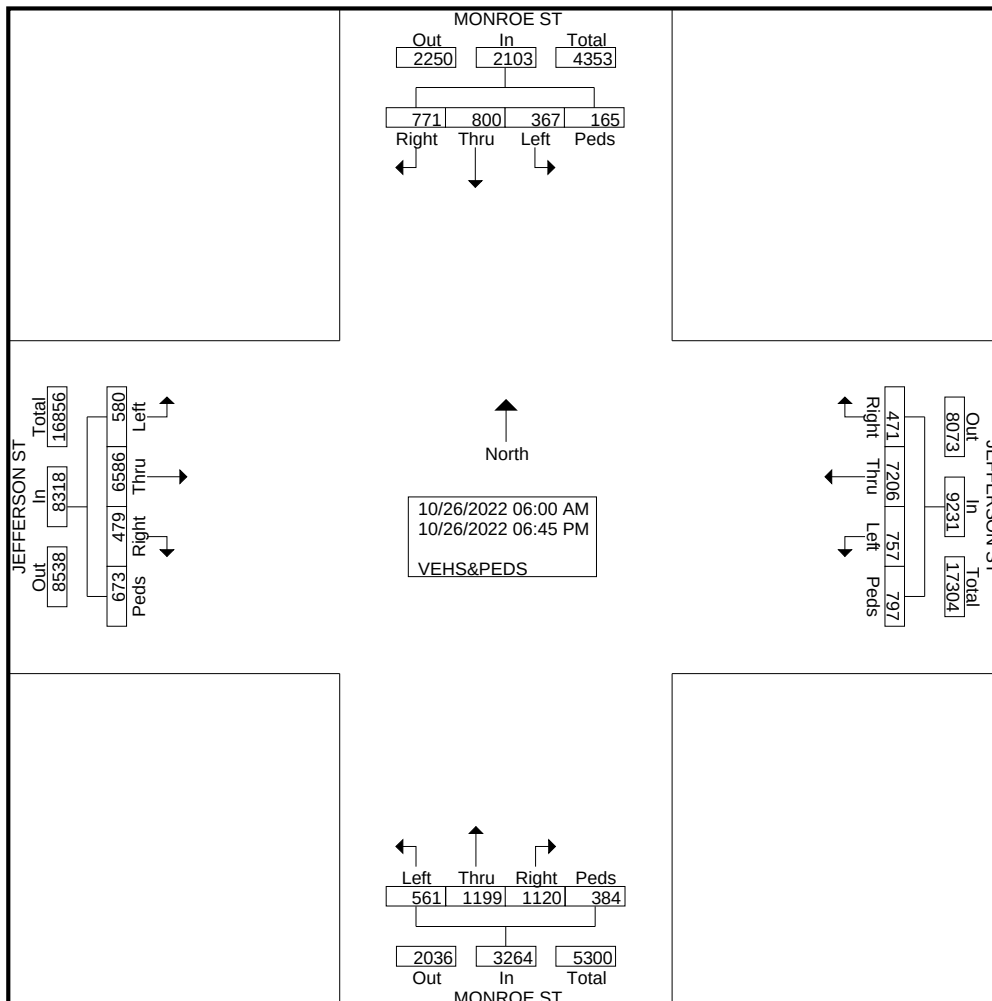


ATTACHMENT A

**Mead & Hunt**

7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

File Name : MONROE ST AT JEFFERSON ST  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 3



ATTACHMENT A

***Mead & Hunt***

7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

File Name : MONROE ST AT JEFFERSON ST  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 4

|            | MONROE ST<br>From North |      |       |      |            | JEFFERSON ST<br>From East |      |       |      |            | MONROE ST<br>From South |      |       |      |            | JEFFERSON ST<br>From West |      |       |      |            |            |
|------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
| Start Time | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Int. Total |

Peak Hour Analysis From 06:00 AM to 06:00 AM - Peak 1 of 1

ATTACHMENT A

**Mead & Hunt**  
7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

Weather:  
Counted By:  
Town:  
Country

File Name : MONROE ST AT JEFFERSON ST  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 1

Groups Printed- U TURNS

|               | MONROE ST<br>From North |      |       |      |            | JEFFERSON ST<br>From East |      |       |      |            | MONROE ST<br>From South |      |       |      |            | JEFFERSON ST<br>From West |      |       |      |            |            |
|---------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
| Start Time    | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Int. Total |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 09:15 AM      | 1                       | 0    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 1                       | 0    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 10:30 AM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1                       | 0    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1                       | 0    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 11:30 AM      | 0                       | 0    | 0     | 0    | 0          | 1                         | 0    | 0     | 0    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 0    | 0     | 0    | 0          | 1                         | 0    | 0     | 0    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 02:00 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 1                         | 0    | 0     | 0    | 1          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 02:45 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1                       | 0    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1                       | 0    | 0     | 0    | 1          | 1                         | 0    | 0     | 0    | 1          | 2          |
| 03:00 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1                       | 0    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |
| 03:15 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 1                         | 0    | 0     | 0    | 1          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1                       | 0    | 0     | 0    | 1          | 1                         | 0    | 0     | 0    | 1          | 2          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 05:15 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 1                         | 0    | 0     | 0    | 1          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 1                         | 0    | 0     | 0    | 1          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 06:15 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 1                         | 0    | 0     | 0    | 1          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 1                         | 0    | 0     | 0    | 1          | 1          |
| Grand Total   | 1                       | 0    | 0     | 0    | 1          | 1                         | 0    | 0     | 0    | 1          | 3                       | 0    | 0     | 0    | 3          | 4                         | 0    | 0     | 0    | 4          | 9          |
| Apprch %      | 100                     | 0    | 0     | 0    |            | 100                       | 0    | 0     | 0    |            | 100                     | 0    | 0     | 0    |            | 100                       | 0    | 0     | 0    |            |            |
| Total %       | 11.1                    | 0    | 0     | 0    | 11.1       | 11.1                      | 0    | 0     | 0    | 11.1       | 33.3                    | 0    | 0     | 0    | 33.3       | 44.4                      | 0    | 0     | 0    | 44.4       |            |

ATTACHMENT A

**Mead & Hunt**  
7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

Weather:  
Counted By:  
Town:  
Country

File Name : MONROE ST AT JEFFERSON ST  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 1

Groups Printed- BICYCLES

|               | MONROE ST<br>From North |      |       |      |            | JEFFERSON ST<br>From East |      |       |      |            | MONROE ST<br>From South |      |       |      |            | JEFFERSON ST<br>From West |      |       |      |            |            |
|---------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
| Start Time    | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Int. Total |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 06:45 AM      | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| Total         | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 07:15 AM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 2          |
| 07:30 AM      | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 2          |
| 07:45 AM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 2          |
| Total         | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 3    | 3          | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 1    | 1          | 6          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 09:15 AM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 2    | 0     | 0    | 2          | 0                         | 0    | 0     | 0    | 0          | 2          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 2    | 0     | 0    | 2          | 0                         | 0    | 0     | 0    | 0          | 2          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 11:15 AM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 1    | 0     | 0    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| 11:30 AM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| 11:45 AM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 1    | 0     | 2    | 3          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 3          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 12:15 PM      | 0                       | 0    | 1     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 2          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 0    | 1     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 2          |
| 01:00 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 0    | 0          | 0                         | 1    | 0     | 0    | 1          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 01:30 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 1    | 0     | 0    | 1          | 2          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 02:30 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 3    | 0     | 1    | 4          | 0                         | 0    | 0     | 0    | 0          | 5          |
| 02:45 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 4    | 0     | 1    | 5          | 0                         | 0    | 0     | 0    | 0          | 6          |
| 03:00 PM      | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 1    | 1          | 0                         | 0    | 0     | 0    | 0          | 2          |
| 03:15 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |
| 03:30 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 1          |
| 03:45 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |
| Total         | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 1    | 1          | 0                       | 2    | 0     | 1    | 3          | 0                         | 0    | 0     | 0    | 0          | 5          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| 04:30 PM      | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 2          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 2          |
| 05:00 PM      | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 1    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |
| *** BREAK *** |                         |      |       |      |            |                           |      |       |      |            |                         |      |       |      |            |                           |      |       |      |            |            |
| Total         | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 0    | 0     | 1    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |

ATTACHMENT A

**Mead & Hunt**

7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

File Name : MONROE ST AT JEFFERSON ST  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 2

Groups Printed- BICYCLES

|             | MONROE ST<br>From North |      |       |      |            | JEFFERSON ST<br>From East |      |       |      |            | MONROE ST<br>From South |      |       |      |            | JEFFERSON ST<br>From West |      |       |      |            |            |
|-------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
| Start Time  | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 PM    | 0                       | 2    | 0     | 0    | 2          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 3          |
| 06:15 PM    | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 1    | 1          | 0                       | 0    | 1     | 0    | 1          | 0                         | 1    | 0     | 0    | 1          | 3          |
| 06:30 PM    | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 2          |
| 06:45 PM    | 0                       | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                       | 1    | 0     | 0    | 1          | 0                         | 0    | 0     | 0    | 0          | 1          |
| Total       | 0                       | 3    | 0     | 0    | 3          | 0                         | 0    | 0     | 2    | 2          | 0                       | 2    | 1     | 0    | 3          | 0                         | 1    | 0     | 0    | 1          | 9          |
| Grand Total | 0                       | 7    | 1     | 0    | 8          | 0                         | 1    | 0     | 11   | 12         | 0                       | 11   | 1     | 3    | 15         | 0                         | 2    | 0     | 2    | 4          | 39         |
| Apprch %    | 0                       | 87.5 | 12.5  | 0    |            | 0                         | 8.3  | 0     | 91.7 |            | 0                       | 73.3 | 6.7   | 20   |            | 0                         | 50   | 0     | 50   |            |            |
| Total %     | 0                       | 17.9 | 2.6   | 0    | 20.5       | 0                         | 2.6  | 0     | 28.2 | 30.8       | 0                       | 28.2 | 2.6   | 7.7  | 38.5       | 0                         | 5.1  | 0     | 5.1  | 10.3       |            |

ATTACHMENT A

**Mead & Hunt**  
7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

Weather:  
Counted By:  
Town:  
Country

File Name : MONROE ST AT MIDDLE LN  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 1

Groups Printed- VEHS&PEDS

| Start Time | MIDDLE LN<br>From East |      |      |            | MONROE ST<br>From South |       |      |            | MIDDLE LN<br>From West |       |      |            | Int. Total |
|------------|------------------------|------|------|------------|-------------------------|-------|------|------------|------------------------|-------|------|------------|------------|
|            | Left                   | Thru | Peds | App. Total | Left                    | Right | Peds | App. Total | Thru                   | Right | Peds | App. Total |            |
| 06:00 AM   | 0                      | 29   | 0    | 29         | 0                       | 2     | 7    | 9          | 17                     | 0     | 0    | 17         | 55         |
| 06:15 AM   | 0                      | 27   | 0    | 27         | 0                       | 4     | 4    | 8          | 30                     | 0     | 1    | 31         | 66         |
| 06:30 AM   | 0                      | 33   | 0    | 33         | 1                       | 5     | 2    | 8          | 33                     | 0     | 2    | 35         | 76         |
| 06:45 AM   | 0                      | 40   | 0    | 40         | 2                       | 6     | 4    | 12         | 42                     | 1     | 1    | 44         | 96         |
| Total      | 0                      | 129  | 0    | 129        | 3                       | 17    | 17   | 37         | 122                    | 1     | 4    | 127        | 293        |
| 07:00 AM   | 2                      | 45   | 1    | 48         | 0                       | 8     | 5    | 13         | 40                     | 1     | 1    | 42         | 103        |
| 07:15 AM   | 0                      | 70   | 0    | 70         | 0                       | 6     | 5    | 11         | 49                     | 0     | 4    | 53         | 134        |
| 07:30 AM   | 0                      | 67   | 0    | 67         | 2                       | 9     | 6    | 17         | 47                     | 7     | 1    | 55         | 139        |
| 07:45 AM   | 0                      | 105  | 0    | 105        | 1                       | 13    | 5    | 19         | 65                     | 3     | 2    | 70         | 194        |
| Total      | 2                      | 287  | 1    | 290        | 3                       | 36    | 21   | 60         | 201                    | 11    | 8    | 220        | 570        |
| 08:00 AM   | 0                      | 99   | 1    | 100        | 0                       | 11    | 7    | 18         | 63                     | 3     | 2    | 68         | 186        |
| 08:15 AM   | 1                      | 79   | 0    | 80         | 2                       | 9     | 11   | 22         | 54                     | 1     | 6    | 61         | 163        |
| 08:30 AM   | 0                      | 85   | 0    | 85         | 3                       | 6     | 10   | 19         | 47                     | 1     | 8    | 56         | 160        |
| 08:45 AM   | 0                      | 111  | 0    | 111        | 1                       | 11    | 11   | 23         | 68                     | 3     | 5    | 76         | 210        |
| Total      | 1                      | 374  | 1    | 376        | 6                       | 37    | 39   | 82         | 232                    | 8     | 21   | 261        | 719        |
| 09:00 AM   | 0                      | 109  | 0    | 109        | 3                       | 12    | 9    | 24         | 69                     | 2     | 5    | 76         | 209        |
| 09:15 AM   | 0                      | 68   | 0    | 68         | 1                       | 14    | 5    | 20         | 62                     | 4     | 3    | 69         | 157        |
| 09:30 AM   | 0                      | 72   | 0    | 72         | 1                       | 12    | 6    | 19         | 65                     | 3     | 3    | 71         | 162        |
| 09:45 AM   | 0                      | 57   | 0    | 57         | 2                       | 8     | 8    | 18         | 57                     | 2     | 0    | 59         | 134        |
| Total      | 0                      | 306  | 0    | 306        | 7                       | 46    | 28   | 81         | 253                    | 11    | 11   | 275        | 662        |
| 10:00 AM   | 0                      | 62   | 0    | 62         | 3                       | 14    | 5    | 22         | 49                     | 1     | 1    | 51         | 135        |
| 10:15 AM   | 1                      | 62   | 0    | 63         | 1                       | 8     | 9    | 18         | 48                     | 1     | 2    | 51         | 132        |
| 10:30 AM   | 1                      | 54   | 0    | 55         | 0                       | 14    | 8    | 22         | 56                     | 3     | 7    | 66         | 143        |
| 10:45 AM   | 1                      | 72   | 1    | 74         | 3                       | 14    | 2    | 19         | 62                     | 3     | 2    | 67         | 160        |
| Total      | 3                      | 250  | 1    | 254        | 7                       | 50    | 24   | 81         | 215                    | 8     | 12   | 235        | 570        |
| 11:00 AM   | 0                      | 72   | 0    | 72         | 1                       | 16    | 3    | 20         | 43                     | 2     | 0    | 45         | 137        |
| 11:15 AM   | 0                      | 65   | 0    | 65         | 2                       | 11    | 6    | 19         | 48                     | 0     | 7    | 55         | 139        |
| 11:30 AM   | 1                      | 68   | 0    | 69         | 2                       | 19    | 2    | 23         | 58                     | 3     | 3    | 64         | 156        |
| 11:45 AM   | 0                      | 64   | 0    | 64         | 2                       | 14    | 8    | 24         | 61                     | 2     | 7    | 70         | 158        |
| Total      | 1                      | 269  | 0    | 270        | 7                       | 60    | 19   | 86         | 210                    | 7     | 17   | 234        | 590        |
| 12:00 PM   | 0                      | 79   | 0    | 79         | 7                       | 10    | 5    | 22         | 68                     | 2     | 10   | 80         | 181        |
| 12:15 PM   | 0                      | 84   | 2    | 86         | 2                       | 24    | 5    | 31         | 69                     | 2     | 10   | 81         | 198        |
| 12:30 PM   | 2                      | 78   | 0    | 80         | 2                       | 22    | 10   | 34         | 72                     | 1     | 6    | 79         | 193        |
| 12:45 PM   | 1                      | 78   | 0    | 79         | 5                       | 10    | 4    | 19         | 64                     | 1     | 4    | 69         | 167        |
| Total      | 3                      | 319  | 2    | 324        | 16                      | 66    | 24   | 106        | 273                    | 6     | 30   | 309        | 739        |
| 01:00 PM   | 0                      | 74   | 0    | 74         | 3                       | 16    | 8    | 27         | 62                     | 3     | 4    | 69         | 170        |
| 01:15 PM   | 0                      | 76   | 0    | 76         | 4                       | 10    | 5    | 19         | 61                     | 4     | 1    | 66         | 161        |
| 01:30 PM   | 0                      | 66   | 2    | 68         | 3                       | 16    | 11   | 30         | 61                     | 3     | 5    | 69         | 167        |
| 01:45 PM   | 0                      | 58   | 0    | 58         | 1                       | 14    | 4    | 19         | 58                     | 0     | 1    | 59         | 136        |
| Total      | 0                      | 274  | 2    | 276        | 11                      | 56    | 28   | 95         | 242                    | 10    | 11   | 263        | 634        |
| 02:00 PM   | 0                      | 74   | 0    | 74         | 3                       | 17    | 12   | 32         | 45                     | 2     | 6    | 53         | 159        |
| 02:15 PM   | 0                      | 72   | 0    | 72         | 4                       | 15    | 7    | 26         | 66                     | 2     | 3    | 71         | 169        |
| 02:30 PM   | 1                      | 71   | 0    | 72         | 1                       | 15    | 4    | 20         | 64                     | 1     | 3    | 68         | 160        |
| 02:45 PM   | 1                      | 68   | 0    | 69         | 1                       | 16    | 11   | 28         | 63                     | 2     | 10   | 75         | 172        |
| Total      | 2                      | 285  | 0    | 287        | 9                       | 63    | 34   | 106        | 238                    | 7     | 22   | 267        | 660        |

ATTACHMENT A

**Mead & Hunt**  
7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

File Name : MONROE ST AT MIDDLE LN  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 2

Groups Printed- VEHS&PEDS

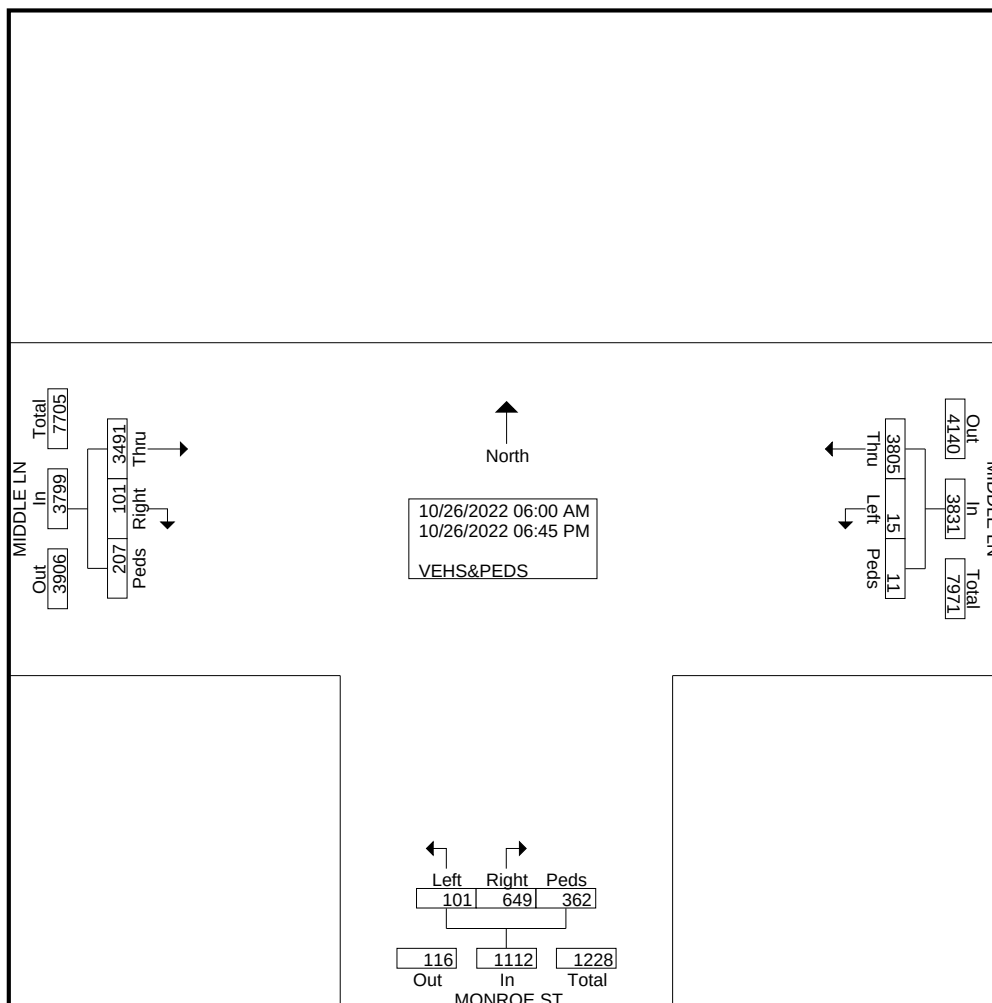
|             | MIDDLE LN<br>From East |      |      |            | MONROE ST<br>From South |       |      |            | MIDDLE LN<br>From West |       |      |            |            |
|-------------|------------------------|------|------|------------|-------------------------|-------|------|------------|------------------------|-------|------|------------|------------|
| Start Time  | Left                   | Thru | Peds | App. Total | Left                    | Right | Peds | App. Total | Thru                   | Right | Peds | App. Total | Int. Total |
| 03:00 PM    | 2                      | 73   | 1    | 76         | 0                       | 16    | 5    | 21         | 74                     | 1     | 6    | 81         | 178        |
| 03:15 PM    | 0                      | 71   | 1    | 72         | 1                       | 5     | 11   | 17         | 86                     | 1     | 4    | 91         | 180        |
| 03:30 PM    | 0                      | 68   | 0    | 68         | 4                       | 12    | 7    | 23         | 81                     | 3     | 8    | 92         | 183        |
| 03:45 PM    | 0                      | 68   | 0    | 68         | 2                       | 11    | 5    | 18         | 83                     | 2     | 4    | 89         | 175        |
| Total       | 2                      | 280  | 2    | 284        | 7                       | 44    | 28   | 79         | 324                    | 7     | 22   | 353        | 716        |
| 04:00 PM    | 0                      | 83   | 0    | 83         | 3                       | 20    | 11   | 34         | 78                     | 2     | 2    | 82         | 199        |
| 04:15 PM    | 0                      | 79   | 0    | 79         | 4                       | 19    | 11   | 34         | 111                    | 1     | 6    | 118        | 231        |
| 04:30 PM    | 0                      | 68   | 0    | 68         | 3                       | 19    | 7    | 29         | 119                    | 1     | 2    | 122        | 219        |
| 04:45 PM    | 0                      | 70   | 2    | 72         | 2                       | 8     | 14   | 24         | 94                     | 0     | 2    | 96         | 192        |
| Total       | 0                      | 300  | 2    | 302        | 12                      | 66    | 43   | 121        | 402                    | 4     | 12   | 418        | 841        |
| 05:00 PM    | 0                      | 88   | 0    | 88         | 2                       | 16    | 8    | 26         | 108                    | 2     | 5    | 115        | 229        |
| 05:15 PM    | 0                      | 96   | 0    | 96         | 2                       | 8     | 9    | 19         | 114                    | 1     | 3    | 118        | 233        |
| 05:30 PM    | 0                      | 89   | 0    | 89         | 3                       | 18    | 6    | 27         | 124                    | 3     | 2    | 129        | 245        |
| 05:45 PM    | 0                      | 81   | 0    | 81         | 0                       | 14    | 10   | 24         | 114                    | 5     | 9    | 128        | 233        |
| Total       | 0                      | 354  | 0    | 354        | 7                       | 56    | 33   | 96         | 460                    | 11    | 19   | 490        | 940        |
| 06:00 PM    | 0                      | 101  | 0    | 101        | 1                       | 16    | 9    | 26         | 89                     | 4     | 4    | 97         | 224        |
| 06:15 PM    | 1                      | 98   | 0    | 99         | 1                       | 8     | 3    | 12         | 73                     | 1     | 11   | 85         | 196        |
| 06:30 PM    | 0                      | 96   | 0    | 96         | 2                       | 16    | 5    | 23         | 73                     | 2     | 2    | 77         | 196        |
| 06:45 PM    | 0                      | 83   | 0    | 83         | 2                       | 12    | 7    | 21         | 84                     | 3     | 1    | 88         | 192        |
| Total       | 1                      | 378  | 0    | 379        | 6                       | 52    | 24   | 82         | 319                    | 10    | 18   | 347        | 808        |
| Grand Total | 15                     | 3805 | 11   | 3831       | 101                     | 649   | 362  | 1112       | 3491                   | 101   | 207  | 3799       | 8742       |
| Apprch %    | 0.4                    | 99.3 | 0.3  |            | 9.1                     | 58.4  | 32.6 |            | 91.9                   | 2.7   | 5.4  |            |            |
| Total %     | 0.2                    | 43.5 | 0.1  | 43.8       | 1.2                     | 7.4   | 4.1  | 12.7       | 39.9                   | 1.2   | 2.4  | 43.5       |            |

ATTACHMENT A

**Mead & Hunt**

7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

File Name : MONROE ST AT MIDDLE LN  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 3





ATTACHMENT A

**Mead & Hunt**

7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

File Name : MONROE ST AT MIDDLE LN  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 4

|            | MIDDLE LN<br>From East |      |      |            | MONROE ST<br>From South |       |      |            | MIDDLE LN<br>From West |       |      |            |            |
|------------|------------------------|------|------|------------|-------------------------|-------|------|------------|------------------------|-------|------|------------|------------|
| Start Time | Left                   | Thru | Peds | App. Total | Left                    | Right | Peds | App. Total | Thru                   | Right | Peds | App. Total | Int. Total |

Peak Hour Analysis From 06:00 AM to 06:00 AM - Peak 1 of 1

ATTACHMENT A

**Mead & Hunt**

7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

Weather:  
Counted By:  
Town:  
Country:

File Name : MONROE ST AT MIDDLE LN  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 1

Groups Printed- U TURNS

|               | MIDDLE LN<br>From East |      |      |            | MONROE ST<br>From South |       |      |            | MIDDLE LN<br>From West |       |      |            |            |
|---------------|------------------------|------|------|------------|-------------------------|-------|------|------------|------------------------|-------|------|------------|------------|
| Start Time    | Left                   | Thru | Peds | App. Total | Left                    | Right | Peds | App. Total | Thru                   | Right | Peds | App. Total | Int. Total |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 07:15 AM      | 1                      | 0    | 0    | 1          | 0                       | 0     | 0    | 0          | 0                      | 0     | 0    | 0          | 1          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Total         | 1                      | 0    | 0    | 1          | 0                       | 0     | 0    | 0          | 0                      | 0     | 0    | 0          | 1          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 01:00 PM      | 0                      | 0    | 0    | 0          | 1                       | 0     | 0    | 1          | 0                      | 0     | 0    | 0          | 1          |
| 01:15 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 01:45 PM      | 1                      | 0    | 0    | 1          | 1                       | 0     | 0    | 1          | 1                      | 0     | 0    | 1          | 3          |
| Total         | 1                      | 0    | 0    | 1          | 2                       | 0     | 0    | 2          | 2                      | 0     | 0    | 2          | 5          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 02:30 PM      | 0                      | 0    | 0    | 0          | 1                       | 0     | 0    | 1          | 1                      | 0     | 0    | 1          | 2          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Total         | 0                      | 0    | 0    | 0          | 1                       | 0     | 0    | 1          | 1                      | 0     | 0    | 1          | 2          |
| 03:00 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 03:30 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| 03:45 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| Total         | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 3                      | 0     | 0    | 3          | 3          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 04:30 PM      | 0                      | 0    | 0    | 0          | 1                       | 0     | 0    | 1          | 1                      | 0     | 0    | 1          | 2          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Total         | 0                      | 0    | 0    | 0          | 1                       | 0     | 0    | 1          | 1                      | 0     | 0    | 1          | 2          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 05:15 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 2                      | 0     | 0    | 2          | 2          |
| 05:30 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| 05:45 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| Total         | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 4                      | 0     | 0    | 4          | 4          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Grand Total   | 2                      | 0    | 0    | 2          | 4                       | 0     | 0    | 4          | 11                     | 0     | 0    | 11         | 17         |
| Apprch %      | 100                    | 0    | 0    |            | 100                     | 0     | 0    |            | 100                    | 0     | 0    |            |            |
| Total %       | 11.8                   | 0    | 0    | 11.8       | 23.5                    | 0     | 0    | 23.5       | 64.7                   | 0     | 0    | 64.7       |            |

ATTACHMENT A

**Mead & Hunt**  
7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

Weather:  
Counted By:  
Town:  
Country

File Name : MONROE ST AT MIDDLE LN  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 1

Groups Printed- BICYCLES

| Start Time    | MIDDLE LN<br>From East |      |      |            | MONROE ST<br>From South |       |      |            | MIDDLE LN<br>From West |       |      |            | Int. Total |
|---------------|------------------------|------|------|------------|-------------------------|-------|------|------------|------------------------|-------|------|------------|------------|
|               | Left                   | Thru | Peds | App. Total | Left                    | Right | Peds | App. Total | Thru                   | Right | Peds | App. Total |            |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 06:15 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 2                      | 0     | 1    | 3          | 3          |
| 06:30 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| 06:45 AM      | 2                      | 0    | 0    | 2          | 0                       | 0     | 0    | 0          | 0                      | 0     | 0    | 0          | 2          |
| Total         | 2                      | 0    | 0    | 2          | 0                       | 0     | 0    | 0          | 3                      | 0     | 1    | 4          | 6          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 07:15 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 0                      | 0     | 1    | 1          | 1          |
| 07:30 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 1     | 0    | 2          | 2          |
| 07:45 AM      | 0                      | 0    | 0    | 0          | 0                       | 1     | 0    | 1          | 0                      | 0     | 0    | 0          | 1          |
| Total         | 0                      | 0    | 0    | 0          | 0                       | 1     | 0    | 1          | 1                      | 1     | 1    | 3          | 4          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 08:30 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| 08:45 AM      | 0                      | 2    | 0    | 2          | 0                       | 0     | 0    | 0          | 0                      | 0     | 0    | 0          | 2          |
| Total         | 0                      | 2    | 0    | 2          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 3          |
| 09:00 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 1    | 1          | 1                      | 0     | 0    | 1          | 2          |
| 09:15 AM      | 0                      | 0    | 0    | 0          | 0                       | 1     | 0    | 1          | 0                      | 0     | 0    | 0          | 1          |
| 09:30 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Total         | 0                      | 0    | 0    | 0          | 0                       | 1     | 1    | 2          | 2                      | 0     | 0    | 2          | 4          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 10:30 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Total         | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| 11:00 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 1    | 1          | 0                      | 0     | 0    | 0          | 1          |
| 11:15 AM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 1    | 1          | 1                      | 0     | 0    | 1          | 2          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Total         | 0                      | 0    | 0    | 0          | 0                       | 0     | 2    | 2          | 1                      | 0     | 0    | 1          | 3          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 12:15 PM      | 0                      | 1    | 0    | 1          | 0                       | 0     | 0    | 0          | 0                      | 0     | 0    | 0          | 1          |
| 12:30 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 1    | 1          | 0                      | 0     | 0    | 0          | 1          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Total         | 0                      | 1    | 0    | 1          | 0                       | 0     | 1    | 1          | 0                      | 0     | 0    | 0          | 2          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 02:30 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 0                      | 0     | 3    | 3          | 3          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Total         | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 0                      | 0     | 3    | 3          | 3          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 03:15 PM      | 0                      | 1    | 0    | 1          | 0                       | 1     | 0    | 1          | 0                      | 0     | 0    | 0          | 2          |
| 03:30 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 1    | 1          | 1                      | 0     | 1    | 2          | 3          |
| 03:45 PM      | 0                      | 1    | 0    | 1          | 0                       | 1     | 0    | 1          | 0                      | 0     | 3    | 3          | 5          |
| Total         | 0                      | 2    | 0    | 2          | 0                       | 2     | 1    | 3          | 1                      | 0     | 4    | 5          | 10         |
| 04:00 PM      | 0                      | 2    | 0    | 2          | 0                       | 0     | 0    | 0          | 0                      | 0     | 0    | 0          | 2          |
| 04:15 PM      | 0                      | 0    | 0    | 0          | 0                       | 1     | 1    | 2          | 0                      | 0     | 0    | 0          | 2          |

ATTACHMENT A

**Mead & Hunt**

7055 Samuel Morse Drive Suite 100  
Columbia, MD 21046  
**1 443 741 3500**

File Name : MONROE ST AT MIDDLE LN  
Site Code : 00000000  
Start Date : 10/26/2022  
Page No : 2

Groups Printed- BICYCLES

|               | MIDDLE LN<br>From East |      |      |            | MONROE ST<br>From South |       |      |            | MIDDLE LN<br>From West |       |      |            |            |
|---------------|------------------------|------|------|------------|-------------------------|-------|------|------------|------------------------|-------|------|------------|------------|
| Start Time    | Left                   | Thru | Peds | App. Total | Left                    | Right | Peds | App. Total | Thru                   | Right | Peds | App. Total | Int. Total |
| 04:30 PM      | 0                      | 1    | 0    | 1          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 2          |
| 04:45 PM      | 0                      | 2    | 0    | 2          | 0                       | 0     | 1    | 1          | 1                      | 0     | 0    | 1          | 4          |
| Total         | 0                      | 5    | 0    | 5          | 0                       | 1     | 2    | 3          | 2                      | 0     | 0    | 2          | 10         |
| 05:00 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 1    | 1          | 0                      | 0     | 1    | 1          | 2          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 05:30 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 0    | 0          | 1                      | 0     | 0    | 1          | 1          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| Total         | 0                      | 0    | 0    | 0          | 0                       | 0     | 1    | 1          | 1                      | 0     | 1    | 2          | 3          |
| 06:00 PM      | 0                      | 0    | 0    | 0          | 0                       | 0     | 2    | 2          | 0                      | 0     | 0    | 0          | 2          |
| *** BREAK *** |                        |      |      |            |                         |       |      |            |                        |       |      |            |            |
| 06:30 PM      | 0                      | 1    | 0    | 1          | 0                       | 0     | 0    | 0          | 0                      | 0     | 0    | 0          | 1          |
| 06:45 PM      | 1                      | 0    | 0    | 1          | 0                       | 0     | 0    | 0          | 0                      | 0     | 0    | 0          | 1          |
| Total         | 1                      | 1    | 0    | 2          | 0                       | 0     | 2    | 2          | 0                      | 0     | 0    | 0          | 4          |
| Grand Total   | 3                      | 11   | 0    | 14         | 0                       | 5     | 10   | 15         | 13                     | 1     | 10   | 24         | 53         |
| Apprch %      | 21.4                   | 78.6 | 0    |            | 0                       | 33.3  | 66.7 |            | 54.2                   | 4.2   | 41.7 |            |            |
| Total %       | 5.7                    | 20.8 | 0    | 26.4       | 0                       | 9.4   | 18.9 | 28.3       | 24.5                   | 1.9   | 18.9 | 45.3       |            |

ATTACHMENT A

Fleet and Monroe Streets, Complete Streets Study  
APPENDICES



## **Appendix B: HCM Reports**

**Existing Conditions, Bike Path, Cycletrack Opt 1, Cycletrack Opt 2**

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
1: Monroe St & E Middle Ln

04/14/2023

|                                   |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |                                                                                   |  |
| Traffic Volume (veh/h)            | 229                                                                               | 14                                                                                | 0                                                                                 | 350                                                                               | 0                                                                                 | 42                                                                                |
| Future Volume (Veh/h)             | 229                                                                               | 14                                                                                | 0                                                                                 | 350                                                                               | 0                                                                                 | 42                                                                                |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              |
| Hourly flow rate (vph)            | 266                                                                               | 16                                                                                | 0                                                                                 | 407                                                                               | 0                                                                                 | 49                                                                                |
| Pedestrians                       | 11                                                                                |                                                                                   |                                                                                   | 1                                                                                 | 29                                                                                |                                                                                   |
| Lane Width (ft)                   | 12.0                                                                              |                                                                                   |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   |
| Walking Speed (ft/s)              | 3.5                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   |
| Percent Blockage                  | 1                                                                                 |                                                                                   |                                                                                   | 0                                                                                 | 3                                                                                 |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   | 311                                                                               |                                                                                   | 518                                                                               | 171                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 311                                                                               |                                                                                   | 518                                                                               | 171                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   | 6.8                                                                               | 6.9                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   | 100                                                                               |                                                                                   | 100                                                                               | 94                                                                                |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 1212                                                                              |                                                                                   | 469                                                                               | 819                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1                                                                              | WB 2                                                                              | NB 1                                                                              |                                                                                   |
| Volume Total                      | 177                                                                               | 105                                                                               | 204                                                                               | 204                                                                               | 49                                                                                |                                                                                   |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |
| Volume Right                      | 0                                                                                 | 16                                                                                | 0                                                                                 | 0                                                                                 | 49                                                                                |                                                                                   |
| cSH                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 819                                                                               |                                                                                   |
| Volume to Capacity                | 0.10                                                                              | 0.06                                                                              | 0.12                                                                              | 0.12                                                                              | 0.06                                                                              |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 5                                                                                 |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 9.7                                                                               |                                                                                   |
| Lane LOS                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 9.7                                                                               |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.6                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 21.5%                                                                             |                                                                                   | ICU Level of Service                                                              | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
2: Monroe St & E Montgomery Ave

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              | Stop                                                                              |                                                                                   |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 3.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 917                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              | A                                                                                 |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
3: Monroe St & Monroe PI

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
|                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |  |  |  |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                    |  |  |                                                                                     |  |                                                                                     |  |  |  |  |  |  |  |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                    | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |  |  |  |  |  |  |  |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 4.5                                                                               | 4.5                                                                               | 4.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 806                                                                               | 806                                                                               | 900                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.3                                                                               | 6.3                                                                               | 7.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |



## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
4: Monroe St & E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |                                                                                   |  |                                                                                     |                                                                                     |  |                                                                                     |
| Traffic Volume (vph)              | 69                                                                                | 568                                                                               | 64                                                                                | 96                                                                                | 674                                                                               | 56                                                                                | 70                                                                                | 135                                                                                 | 71                                                                                  | 15                                                                                  | 78                                                                                  | 41                                                                                  |
| Future Volume (vph)               | 69                                                                                | 568                                                                               | 64                                                                                | 96                                                                                | 674                                                                               | 56                                                                                | 70                                                                                | 135                                                                                 | 71                                                                                  | 15                                                                                  | 78                                                                                  | 41                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   |                                                                                   | 6.0                                                                                 |                                                                                     |                                                                                     | 6.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                                |                                                                                     |                                                                                     | 0.95                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.98                                                                                |                                                                                     |                                                                                     | 0.97                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.98                                                                                |                                                                                     |                                                                                     | 0.99                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   |                                                                                   | 0.96                                                                                |                                                                                     |                                                                                     | 0.95                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.99                                                                                |                                                                                     |                                                                                     | 0.99                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1592                                                                              | 3129                                                                              |                                                                                   | 1590                                                                              | 3144                                                                              |                                                                                   |                                                                                   | 2909                                                                                |                                                                                     |                                                                                     | 2918                                                                                |                                                                                     |
| Flt Permitted                     | 0.30                                                                              | 1.00                                                                              |                                                                                   | 0.34                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.83                                                                                |                                                                                     |                                                                                     | 0.90                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 497                                                                               | 3129                                                                              |                                                                                   | 563                                                                               | 3144                                                                              |                                                                                   |                                                                                   | 2435                                                                                |                                                                                     |                                                                                     | 2640                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                |
| Adj. Flow (vph)                   | 73                                                                                | 604                                                                               | 68                                                                                | 102                                                                               | 717                                                                               | 60                                                                                | 74                                                                                | 144                                                                                 | 76                                                                                  | 16                                                                                  | 83                                                                                  | 44                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 73                                                                                | 672                                                                               | 0                                                                                 | 102                                                                               | 777                                                                               | 0                                                                                 | 0                                                                                 | 294                                                                                 | 0                                                                                   | 0                                                                                   | 143                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 8                                                                                 |                                                                                   | 16                                                                                | 16                                                                                |                                                                                   | 8                                                                                 | 66                                                                                |                                                                                     | 59                                                                                  | 59                                                                                  |                                                                                     | 66                                                                                  |
| Turn Type                         | pm+pt                                                                             | NA                                                                                |                                                                                   | pm+pt                                                                             | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  | 1                                                                                 | 6                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 49.3                                                                              | 43.3                                                                              |                                                                                   | 50.7                                                                              | 44.0                                                                              |                                                                                   |                                                                                   | 23.0                                                                                |                                                                                     |                                                                                     | 23.0                                                                                |                                                                                     |
| Effective Green, g (s)            | 49.3                                                                              | 43.3                                                                              |                                                                                   | 50.7                                                                              | 44.0                                                                              |                                                                                   |                                                                                   | 23.0                                                                                |                                                                                     |                                                                                     | 23.0                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.55                                                                              | 0.48                                                                              |                                                                                   | 0.56                                                                              | 0.49                                                                              |                                                                                   |                                                                                   | 0.26                                                                                |                                                                                     |                                                                                     | 0.26                                                                                |                                                                                     |
| Clearance Time (s)                | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   |                                                                                   | 6.0                                                                                 |                                                                                     |                                                                                     | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |                                                                                   | 3.0                                                                                 |                                                                                     |                                                                                     | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 345                                                                               | 1505                                                                              |                                                                                   | 393                                                                               | 1537                                                                              |                                                                                   |                                                                                   | 622                                                                                 |                                                                                     |                                                                                     | 674                                                                                 |                                                                                     |
| v/s Ratio Prot                    | 0.01                                                                              | 0.21                                                                              |                                                                                   | c0.02                                                                             | c0.25                                                                             |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/s Ratio Perm                    | 0.10                                                                              |                                                                                   |                                                                                   | 0.13                                                                              |                                                                                   |                                                                                   |                                                                                   | c0.12                                                                               |                                                                                     |                                                                                     | 0.05                                                                                |                                                                                     |
| v/c Ratio                         | 0.21                                                                              | 0.45                                                                              |                                                                                   | 0.26                                                                              | 0.51                                                                              |                                                                                   |                                                                                   | 0.47                                                                                |                                                                                     |                                                                                     | 0.21                                                                                |                                                                                     |
| Uniform Delay, d1                 | 10.0                                                                              | 15.4                                                                              |                                                                                   | 9.5                                                                               | 15.6                                                                              |                                                                                   |                                                                                   | 28.4                                                                                |                                                                                     |                                                                                     | 26.4                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.85                                                                                |                                                                                     |                                                                                     | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 0.3                                                                               | 1.0                                                                               |                                                                                   | 0.4                                                                               | 1.2                                                                               |                                                                                   |                                                                                   | 0.5                                                                                 |                                                                                     |                                                                                     | 0.2                                                                                 |                                                                                     |
| Delay (s)                         | 10.3                                                                              | 16.4                                                                              |                                                                                   | 9.8                                                                               | 16.8                                                                              |                                                                                   |                                                                                   | 24.7                                                                                |                                                                                     |                                                                                     | 26.5                                                                                |                                                                                     |
| Level of Service                  | B                                                                                 | B                                                                                 |                                                                                   | A                                                                                 | B                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 15.8                                                                              |                                                                                   |                                                                                   | 16.0                                                                              |                                                                                   |                                                                                   | 24.7                                                                                |                                                                                     |                                                                                     | 26.5                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 17.9                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.48                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                     | 17.0                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 64.2%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
5: Monroe St & Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                    |  |                                                                                     |                                                                                     |  |  |
| Traffic Volume (vph)              | 148                                                                               | 314                                                                               | 62                                                                                | 10                                                                                | 275                                                                               | 81                                                                                | 43                                                                                 | 69                                                                                  | 21                                                                                  | 43                                                                                  | 43                                                                                  | 83                                                                                  |
| Future Volume (vph)               | 148                                                                               | 314                                                                               | 62                                                                                | 10                                                                                | 275                                                                               | 81                                                                                | 43                                                                                 | 69                                                                                  | 21                                                                                  | 43                                                                                  | 43                                                                                  | 83                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                    | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 1.00                                                                                |
| Frpb, ped/bikes                   |                                                                                   | 0.99                                                                              |                                                                                   |                                                                                   | 0.99                                                                              |                                                                                   |                                                                                    | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 0.93                                                                                |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                    | 0.99                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 1.00                                                                                |
| Frt                               |                                                                                   | 0.98                                                                              |                                                                                   |                                                                                   | 0.97                                                                              |                                                                                   |                                                                                    | 0.98                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     |                                                                                   | 0.99                                                                              |                                                                                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                    | 0.98                                                                                |                                                                                     |                                                                                     | 0.98                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 |                                                                                   | 3052                                                                              |                                                                                   |                                                                                   | 3050                                                                              |                                                                                   |                                                                                    | 1588                                                                                |                                                                                     |                                                                                     | 1632                                                                                | 1329                                                                                |
| Flt Permitted                     |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   | 0.93                                                                              |                                                                                   |                                                                                    | 0.84                                                                                |                                                                                     |                                                                                     | 0.68                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 |                                                                                   | 2069                                                                              |                                                                                   |                                                                                   | 2837                                                                              |                                                                                   |                                                                                    | 1358                                                                                |                                                                                     |                                                                                     | 1131                                                                                | 1329                                                                                |
| Peak-hour factor, PHF             | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                               | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                |
| Adj. Flow (vph)                   | 224                                                                               | 476                                                                               | 94                                                                                | 15                                                                                | 417                                                                               | 123                                                                               | 65                                                                                 | 105                                                                                 | 32                                                                                  | 65                                                                                  | 65                                                                                  | 126                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 8                                                                                 | 0                                                                                 | 0                                                                                 | 21                                                                                | 0                                                                                 | 0                                                                                  | 9                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 39                                                                                  |
| Lane Group Flow (vph)             | 0                                                                                 | 786                                                                               | 0                                                                                 | 0                                                                                 | 534                                                                               | 0                                                                                 | 0                                                                                  | 193                                                                                 | 0                                                                                   | 0                                                                                   | 130                                                                                 | 87                                                                                  |
| Confl. Peds. (#/hr)               | 20                                                                                |                                                                                   | 19                                                                                | 19                                                                                |                                                                                   | 20                                                                                | 40                                                                                 |                                                                                     | 5                                                                                   | 5                                                                                   |                                                                                     | 40                                                                                  |
| Turn Type                         | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                               | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  | custom                                                                              |
| Protected Phases                  |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                  |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     | 6                                                                                   |
| Actuated Green, G (s)             |                                                                                   | 62.3                                                                              |                                                                                   |                                                                                   | 62.3                                                                              |                                                                                   |                                                                                    | 17.7                                                                                |                                                                                     |                                                                                     | 17.7                                                                                | 62.3                                                                                |
| Effective Green, g (s)            |                                                                                   | 62.3                                                                              |                                                                                   |                                                                                   | 62.3                                                                              |                                                                                   |                                                                                    | 17.7                                                                                |                                                                                     |                                                                                     | 17.7                                                                                | 62.3                                                                                |
| Actuated g/C Ratio                |                                                                                   | 0.69                                                                              |                                                                                   |                                                                                   | 0.69                                                                              |                                                                                   |                                                                                    | 0.20                                                                                |                                                                                     |                                                                                     | 0.20                                                                                | 0.69                                                                                |
| Clearance Time (s)                |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |
| Vehicle Extension (s)             |                                                                                   | 3.0                                                                               |                                                                                   |                                                                                   | 3.0                                                                               |                                                                                   |                                                                                    | 3.0                                                                                 |                                                                                     |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |
| Lane Grp Cap (vph)                |                                                                                   | 1432                                                                              |                                                                                   |                                                                                   | 1963                                                                              |                                                                                   |                                                                                    | 267                                                                                 |                                                                                     |                                                                                     | 222                                                                                 | 919                                                                                 |
| v/s Ratio Prot                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/s Ratio Perm                    |                                                                                   | c0.38                                                                             |                                                                                   |                                                                                   | 0.19                                                                              |                                                                                   |                                                                                    | c0.14                                                                               |                                                                                     |                                                                                     | 0.11                                                                                | 0.07                                                                                |
| v/c Ratio                         |                                                                                   | 0.55                                                                              |                                                                                   |                                                                                   | 0.27                                                                              |                                                                                   |                                                                                    | 0.72                                                                                |                                                                                     |                                                                                     | 0.59                                                                                | 0.09                                                                                |
| Uniform Delay, d1                 |                                                                                   | 6.9                                                                               |                                                                                   |                                                                                   | 5.3                                                                               |                                                                                   |                                                                                    | 33.9                                                                                |                                                                                     |                                                                                     | 32.8                                                                                | 4.6                                                                                 |
| Progression Factor                |                                                                                   | 0.85                                                                              |                                                                                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                    | 1.00                                                                                |                                                                                     |                                                                                     | 0.98                                                                                | 2.62                                                                                |
| Incremental Delay, d2             |                                                                                   | 1.3                                                                               |                                                                                   |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                    | 9.3                                                                                 |                                                                                     |                                                                                     | 3.8                                                                                 | 0.2                                                                                 |
| Delay (s)                         |                                                                                   | 7.2                                                                               |                                                                                   |                                                                                   | 5.6                                                                               |                                                                                   |                                                                                    | 43.2                                                                                |                                                                                     |                                                                                     | 35.9                                                                                | 12.2                                                                                |
| Level of Service                  |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   | B                                                                                   |
| Approach Delay (s)                |                                                                                   | 7.2                                                                               |                                                                                   |                                                                                   | 5.6                                                                               |                                                                                   |                                                                                    | 43.2                                                                                |                                                                                     |                                                                                     | 24.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 13.1                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.59                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 10.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 69.4%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 6: Maryland Ave &amp; Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |  |                                                                                   |  |                                                                                    |  |  |  |  |  |
| Traffic Volume (vph)              | 2                                                                                 | 1                                                                                 | 1                                                                                 | 315                                                                               | 0                                                                                 | 101                                                                               | 0                                                                                  | 276                                                                                 | 451                                                                                 | 87                                                                                  | 245                                                                                 | 0                                                                                   |
| Future Volume (vph)               | 2                                                                                 | 1                                                                                 | 1                                                                                 | 315                                                                               | 0                                                                                 | 101                                                                               | 0                                                                                  | 276                                                                                 | 451                                                                                 | 87                                                                                  | 245                                                                                 | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                    | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 0.98                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.97                                                                              |                                                                                    | 1.00                                                                                | 0.98                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.97                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.85                                                                              |                                                                                    | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 1545                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1384                                                                              |                                                                                    | 1676                                                                                | 1403                                                                                | 1593                                                                                | 1676                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 0.27                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 1545                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1384                                                                              |                                                                                    | 1676                                                                                | 1403                                                                                | 456                                                                                 | 1676                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                               | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                |
| Adj. Flow (vph)                   | 3                                                                                 | 1                                                                                 | 1                                                                                 | 399                                                                               | 0                                                                                 | 128                                                                               | 0                                                                                  | 349                                                                                 | 571                                                                                 | 110                                                                                 | 310                                                                                 | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 88                                                                                | 0                                                                                  | 0                                                                                   | 407                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 4                                                                                 | 0                                                                                 | 399                                                                               | 0                                                                                 | 40                                                                                | 0                                                                                  | 349                                                                                 | 164                                                                                 | 110                                                                                 | 310                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 3                                                                                 |                                                                                   | 3                                                                                 | 3                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                  |                                                                                     | 2                                                                                   | 2                                                                                   |                                                                                     | 7                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                |                                                                                   | Prot                                                                              |                                                                                   | Perm                                                                              |                                                                                    | NA                                                                                  | Perm                                                                                | pm+pt                                                                               | NA                                                                                  |                                                                                     |
| Protected Phases                  | 3                                                                                 | 3                                                                                 |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   |                                                                                    | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 4                                                                                 |                                                                                    |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 1.3                                                                               |                                                                                   | 28.0                                                                              |                                                                                   | 28.0                                                                              |                                                                                    | 25.9                                                                                | 25.9                                                                                | 47.2                                                                                | 47.2                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 1.3                                                                               |                                                                                   | 28.0                                                                              |                                                                                   | 28.0                                                                              |                                                                                    | 25.9                                                                                | 25.9                                                                                | 47.2                                                                                | 47.2                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.01                                                                              |                                                                                   | 0.31                                                                              |                                                                                   | 0.31                                                                              |                                                                                    | 0.29                                                                                | 0.29                                                                                | 0.52                                                                                | 0.52                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                    | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 4.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                    | 5.0                                                                                 | 5.0                                                                                 | 3.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 22                                                                                |                                                                                   | 495                                                                               |                                                                                   | 430                                                                               |                                                                                    | 482                                                                                 | 403                                                                                 | 451                                                                                 | 878                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.00                                                                             |                                                                                   | c0.25                                                                             |                                                                                   |                                                                                   |                                                                                    | c0.21                                                                               |                                                                                     | 0.05                                                                                | c0.18                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.03                                                                              |                                                                                    |                                                                                     | 0.12                                                                                | 0.08                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.18                                                                              |                                                                                   | 0.81                                                                              |                                                                                   | 0.09                                                                              |                                                                                    | 0.72                                                                                | 0.41                                                                                | 0.24                                                                                | 0.35                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 43.8                                                                              |                                                                                   | 28.5                                                                              |                                                                                   | 22.0                                                                              |                                                                                    | 28.8                                                                                | 25.9                                                                                | 12.4                                                                                | 12.5                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   | 1.01                                                                              |                                                                                   | 1.45                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 5.4                                                                               |                                                                                   | 8.6                                                                               |                                                                                   | 0.0                                                                               |                                                                                    | 9.1                                                                                 | 3.0                                                                                 | 1.3                                                                                 | 1.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 49.2                                                                              |                                                                                   | 37.4                                                                              |                                                                                   | 32.0                                                                              |                                                                                    | 38.0                                                                                | 28.9                                                                                | 13.7                                                                                | 13.6                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   | C                                                                                 |                                                                                    | D                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 49.2                                                                              |                                                                                   |                                                                                   | 36.1                                                                              |                                                                                   |                                                                                    | 32.3                                                                                |                                                                                     |                                                                                     | 13.6                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 29.3                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                    |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                    |                                                                                     | 18.0                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 58.4%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                    |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
7: MD 355 & E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                | ↑                                                                                 | ↑↑                                                                                 | ↑↑↑                                                                                 |                                                                                     | ↑↑                                                                                  | ↑↑↑                                                                                 |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 307                                                                               | 305                                                                               | 0                                                                                 | 683                                                                               | 387                                                                               | 170                                                                                | 525                                                                                 | 0                                                                                   | 325                                                                                 | 1208                                                                                | 49                                                                                  |
| Future Volume (vph)               | 0                                                                                 | 307                                                                               | 305                                                                               | 0                                                                                 | 683                                                                               | 387                                                                               | 170                                                                                | 525                                                                                 | 0                                                                                   | 325                                                                                 | 1208                                                                                | 49                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              | 1.00                                                                              | 0.97                                                                               | 0.91                                                                                |                                                                                     | 0.97                                                                                | 0.91                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.93                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.99                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 2947                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4544                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 2947                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4544                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                               | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 313                                                                               | 311                                                                               | 0                                                                                 | 697                                                                               | 395                                                                               | 173                                                                                | 536                                                                                 | 0                                                                                   | 332                                                                                 | 1233                                                                                | 50                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 120                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 284                                                                               | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 3                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 504                                                                               | 0                                                                                 | 0                                                                                 | 697                                                                               | 111                                                                               | 173                                                                                | 536                                                                                 | 0                                                                                   | 332                                                                                 | 1280                                                                                | 0                                                                                   |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 10                                                                                  |
| Turn Type                         |                                                                                   | NA                                                                                |                                                                                   |                                                                                   | NA                                                                                | Perm                                                                              | Prot                                                                               | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 1                                                                                  | 5                                                                                   |                                                                                     | 6                                                                                   | 2                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 38.0                                                                              |                                                                                   |                                                                                   | 38.0                                                                              | 38.0                                                                              | 13.0                                                                               | 45.0                                                                                |                                                                                     | 41.0                                                                                | 73.0                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 38.0                                                                              |                                                                                   |                                                                                   | 38.0                                                                              | 38.0                                                                              | 13.0                                                                               | 45.0                                                                                |                                                                                     | 41.0                                                                                | 73.0                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.25                                                                              |                                                                                   |                                                                                   | 0.25                                                                              | 0.25                                                                              | 0.09                                                                               | 0.30                                                                                |                                                                                     | 0.27                                                                                | 0.49                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 7.0                                                                                | 0.2                                                                                 |                                                                                     | 5.0                                                                                 | 0.2                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 746                                                                               |                                                                                   |                                                                                   | 806                                                                               | 361                                                                               | 267                                                                                | 1373                                                                                |                                                                                     | 844                                                                                 | 2211                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | 0.17                                                                              |                                                                                   |                                                                                   | c0.22                                                                             |                                                                                   | c0.06                                                                              | 0.12                                                                                |                                                                                     | 0.11                                                                                | c0.28                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.08                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.68                                                                              |                                                                                   |                                                                                   | 0.86                                                                              | 0.31                                                                              | 0.65                                                                               | 0.39                                                                                |                                                                                     | 0.39                                                                                | 0.58                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 50.4                                                                              |                                                                                   |                                                                                   | 53.5                                                                              | 45.3                                                                              | 66.3                                                                               | 41.6                                                                                |                                                                                     | 44.4                                                                                | 27.5                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 4.9                                                                               |                                                                                   |                                                                                   | 11.9                                                                              | 2.2                                                                               | 9.9                                                                                | 0.8                                                                                 |                                                                                     | 1.4                                                                                 | 1.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 55.3                                                                              |                                                                                   |                                                                                   | 65.5                                                                              | 47.5                                                                              | 76.2                                                                               | 42.5                                                                                |                                                                                     | 45.8                                                                                | 28.6                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | D                                                                                 | E                                                                                  | D                                                                                   |                                                                                     | D                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 55.3                                                                              |                                                                                   |                                                                                   | 59.0                                                                              |                                                                                   |                                                                                    | 50.7                                                                                |                                                                                     |                                                                                     | 32.1                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 46.2                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 150.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 75.2%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
1: Monroe St & E Middle Ln

04/14/2023

|                                   |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |                                                                                   |  |
| Traffic Volume (veh/h)            | 435                                                                               | 4                                                                                 | 0                                                                                 | 322                                                                               | 0                                                                                 | 51                                                                                |
| Future Volume (Veh/h)             | 435                                                                               | 4                                                                                 | 0                                                                                 | 322                                                                               | 0                                                                                 | 51                                                                                |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              |
| Hourly flow rate (vph)            | 500                                                                               | 5                                                                                 | 0                                                                                 | 370                                                                               | 0                                                                                 | 59                                                                                |
| Pedestrians                       | 12                                                                                |                                                                                   |                                                                                   | 2                                                                                 | 38                                                                                |                                                                                   |
| Lane Width (ft)                   | 12.0                                                                              |                                                                                   |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   |
| Walking Speed (ft/s)              | 3.5                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   |
| Percent Blockage                  | 1                                                                                 |                                                                                   |                                                                                   | 0                                                                                 | 4                                                                                 |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   | 543                                                                               |                                                                                   | 738                                                                               | 292                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 543                                                                               |                                                                                   | 738                                                                               | 292                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   | 6.8                                                                               | 6.9                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   | 100                                                                               |                                                                                   | 100                                                                               | 91                                                                                |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 985                                                                               |                                                                                   | 337                                                                               | 677                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1                                                                              | WB 2                                                                              | NB 1                                                                              |                                                                                   |
| Volume Total                      | 333                                                                               | 172                                                                               | 185                                                                               | 185                                                                               | 59                                                                                |                                                                                   |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |
| Volume Right                      | 0                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                 | 59                                                                                |                                                                                   |
| cSH                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 677                                                                               |                                                                                   |
| Volume to Capacity                | 0.20                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.09                                                                              |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 7                                                                                 |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 10.8                                                                              |                                                                                   |
| Lane LOS                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 10.8                                                                              |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.7                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 24.5%                                                                             |                                                                                   | ICU Level of Service                                                              | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
2: Monroe St & E Montgomery Ave

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              | Stop                                                                              |                                                                                   |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 3.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 917                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              | A                                                                                 |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
3: Monroe St & Monroe PI

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |  |  |  |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                   |  |  |                                                                                     |  |                                                                                     |  |  |  |  |  |  |  |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |  |  |  |  |  |  |  |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 4.5                                                                               | 4.5                                                                               | 4.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 806                                                                               | 806                                                                               | 900                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.3                                                                               | 6.3                                                                               | 7.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 4: Monroe St &amp; E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |                                                                                   |  |                                                                                     |                                                                                     |  |                                                                                     |
| Traffic Volume (vph)              | 47                                                                                | 744                                                                               | 37                                                                                | 53                                                                                | 652                                                                               | 30                                                                                | 65                                                                                | 106                                                                                 | 183                                                                                 | 62                                                                                  | 97                                                                                  | 96                                                                                  |
| Future Volume (vph)               | 47                                                                                | 744                                                                               | 37                                                                                | 53                                                                                | 652                                                                               | 30                                                                                | 65                                                                                | 106                                                                                 | 183                                                                                 | 62                                                                                  | 97                                                                                  | 96                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   |                                                                                   | 6.0                                                                                 |                                                                                     |                                                                                     | 6.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                                |                                                                                     |                                                                                     | 0.95                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.96                                                                                |                                                                                     |                                                                                     | 0.96                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.99                                                                                |                                                                                     |                                                                                     | 0.99                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   |                                                                                   | 0.92                                                                                |                                                                                     |                                                                                     | 0.94                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.99                                                                                |                                                                                     |                                                                                     | 0.99                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1592                                                                              | 3158                                                                              |                                                                                   | 1591                                                                              | 3161                                                                              |                                                                                   |                                                                                   | 2774                                                                                |                                                                                     |                                                                                     | 2825                                                                                |                                                                                     |
| Flt Permitted                     | 0.32                                                                              | 1.00                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.82                                                                                |                                                                                     |                                                                                     | 0.74                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 539                                                                               | 3158                                                                              |                                                                                   | 419                                                                               | 3161                                                                              |                                                                                   |                                                                                   | 2292                                                                                |                                                                                     |                                                                                     | 2103                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 51                                                                                | 809                                                                               | 40                                                                                | 58                                                                                | 709                                                                               | 33                                                                                | 71                                                                                | 115                                                                                 | 199                                                                                 | 67                                                                                  | 105                                                                                 | 104                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 51                                                                                | 849                                                                               | 0                                                                                 | 58                                                                                | 742                                                                               | 0                                                                                 | 0                                                                                 | 385                                                                                 | 0                                                                                   | 0                                                                                   | 276                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 8                                                                                 |                                                                                   | 19                                                                                | 19                                                                                |                                                                                   | 8                                                                                 | 77                                                                                |                                                                                     | 49                                                                                  | 49                                                                                  |                                                                                     | 77                                                                                  |
| Turn Type                         | pm+pt                                                                             | NA                                                                                |                                                                                   | pm+pt                                                                             | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  | 1                                                                                 | 6                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 47.9                                                                              | 43.6                                                                              |                                                                                   | 50.5                                                                              | 44.9                                                                              |                                                                                   |                                                                                   | 23.8                                                                                |                                                                                     |                                                                                     | 23.8                                                                                |                                                                                     |
| Effective Green, g (s)            | 47.9                                                                              | 43.6                                                                              |                                                                                   | 50.5                                                                              | 44.9                                                                              |                                                                                   |                                                                                   | 23.8                                                                                |                                                                                     |                                                                                     | 23.8                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.53                                                                              | 0.48                                                                              |                                                                                   | 0.56                                                                              | 0.50                                                                              |                                                                                   |                                                                                   | 0.26                                                                                |                                                                                     |                                                                                     | 0.26                                                                                |                                                                                     |
| Clearance Time (s)                | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   |                                                                                   | 6.0                                                                                 |                                                                                     |                                                                                     | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |                                                                                   | 3.0                                                                                 |                                                                                     |                                                                                     | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 337                                                                               | 1529                                                                              |                                                                                   | 308                                                                               | 1576                                                                              |                                                                                   |                                                                                   | 606                                                                                 |                                                                                     |                                                                                     | 556                                                                                 |                                                                                     |
| v/s Ratio Prot                    | 0.01                                                                              | c0.27                                                                             |                                                                                   | c0.01                                                                             | 0.23                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/s Ratio Perm                    | 0.07                                                                              |                                                                                   |                                                                                   | 0.09                                                                              |                                                                                   |                                                                                   |                                                                                   | c0.17                                                                               |                                                                                     |                                                                                     | 0.13                                                                                |                                                                                     |
| v/c Ratio                         | 0.15                                                                              | 0.56                                                                              |                                                                                   | 0.19                                                                              | 0.47                                                                              |                                                                                   |                                                                                   | 0.64                                                                                |                                                                                     |                                                                                     | 0.50                                                                                |                                                                                     |
| Uniform Delay, d1                 | 10.4                                                                              | 16.4                                                                              |                                                                                   | 9.8                                                                               | 14.8                                                                              |                                                                                   |                                                                                   | 29.3                                                                                |                                                                                     |                                                                                     | 28.0                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.45                                                                              | 1.76                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 0.2                                                                               | 1.5                                                                               |                                                                                   | 0.3                                                                               | 0.9                                                                               |                                                                                   |                                                                                   | 2.1                                                                                 |                                                                                     |                                                                                     | 0.7                                                                                 |                                                                                     |
| Delay (s)                         | 10.6                                                                              | 17.8                                                                              |                                                                                   | 14.4                                                                              | 26.9                                                                              |                                                                                   |                                                                                   | 31.3                                                                                |                                                                                     |                                                                                     | 28.7                                                                                |                                                                                     |
| Level of Service                  | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 17.4                                                                              |                                                                                   |                                                                                   | 26.0                                                                              |                                                                                   |                                                                                   | 31.3                                                                                |                                                                                     |                                                                                     | 28.7                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 23.9                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.55                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                     | 17.0                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 85.0%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                     | E                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
5: Monroe St & Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                    |  |                                                                                     |                                                                                     |  |  |
| Traffic Volume (vph)              | 157                                                                               | 189                                                                               | 83                                                                                | 13                                                                                | 180                                                                               | 44                                                                                | 11                                                                                 | 66                                                                                  | 7                                                                                   | 9                                                                                   | 73                                                                                  | 134                                                                                 |
| Future Volume (vph)               | 157                                                                               | 189                                                                               | 83                                                                                | 13                                                                                | 180                                                                               | 44                                                                                | 11                                                                                 | 66                                                                                  | 7                                                                                   | 9                                                                                   | 73                                                                                  | 134                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                    | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 1.00                                                                                |
| Frpb, ped/bikes                   |                                                                                   | 0.99                                                                              |                                                                                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                    | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 0.98                                                                                |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                    | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 1.00                                                                                |
| Frt                               |                                                                                   | 0.97                                                                              |                                                                                   |                                                                                   | 0.97                                                                              |                                                                                   |                                                                                    | 0.99                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     |                                                                                   | 0.98                                                                              |                                                                                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                    | 0.99                                                                                |                                                                                     |                                                                                     | 0.99                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 |                                                                                   | 2987                                                                              |                                                                                   |                                                                                   | 3072                                                                              |                                                                                   |                                                                                    | 1640                                                                                |                                                                                     |                                                                                     | 1664                                                                                | 1394                                                                                |
| Flt Permitted                     |                                                                                   | 0.69                                                                              |                                                                                   |                                                                                   | 0.90                                                                              |                                                                                   |                                                                                    | 0.94                                                                                |                                                                                     |                                                                                     | 0.96                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 |                                                                                   | 2085                                                                              |                                                                                   |                                                                                   | 2781                                                                              |                                                                                   |                                                                                    | 1559                                                                                |                                                                                     |                                                                                     | 1606                                                                                | 1394                                                                                |
| Peak-hour factor, PHF             | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                               | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                |
| Adj. Flow (vph)                   | 262                                                                               | 315                                                                               | 138                                                                               | 22                                                                                | 300                                                                               | 73                                                                                | 18                                                                                 | 110                                                                                 | 12                                                                                  | 15                                                                                  | 122                                                                                 | 223                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 11                                                                                | 0                                                                                 | 0                                                                                  | 5                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 57                                                                                  |
| Lane Group Flow (vph)             | 0                                                                                 | 703                                                                               | 0                                                                                 | 0                                                                                 | 384                                                                               | 0                                                                                 | 0                                                                                  | 135                                                                                 | 0                                                                                   | 0                                                                                   | 137                                                                                 | 166                                                                                 |
| Confl. Peds. (#/hr)               | 9                                                                                 |                                                                                   | 23                                                                                | 23                                                                                |                                                                                   | 9                                                                                 | 7                                                                                  |                                                                                     | 19                                                                                  | 19                                                                                  |                                                                                     | 7                                                                                   |
| Turn Type                         | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                               | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  | custom                                                                              |
| Protected Phases                  |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                  |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     | 6                                                                                   |
| Actuated Green, G (s)             |                                                                                   | 66.9                                                                              |                                                                                   |                                                                                   | 66.9                                                                              |                                                                                   |                                                                                    | 13.1                                                                                |                                                                                     |                                                                                     | 13.1                                                                                | 66.9                                                                                |
| Effective Green, g (s)            |                                                                                   | 66.9                                                                              |                                                                                   |                                                                                   | 66.9                                                                              |                                                                                   |                                                                                    | 13.1                                                                                |                                                                                     |                                                                                     | 13.1                                                                                | 66.9                                                                                |
| Actuated g/C Ratio                |                                                                                   | 0.74                                                                              |                                                                                   |                                                                                   | 0.74                                                                              |                                                                                   |                                                                                    | 0.15                                                                                |                                                                                     |                                                                                     | 0.15                                                                                | 0.74                                                                                |
| Clearance Time (s)                |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |
| Vehicle Extension (s)             |                                                                                   | 3.0                                                                               |                                                                                   |                                                                                   | 3.0                                                                               |                                                                                   |                                                                                    | 3.0                                                                                 |                                                                                     |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |
| Lane Grp Cap (vph)                |                                                                                   | 1549                                                                              |                                                                                   |                                                                                   | 2067                                                                              |                                                                                   |                                                                                    | 226                                                                                 |                                                                                     |                                                                                     | 233                                                                                 | 1036                                                                                |
| v/s Ratio Prot                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/s Ratio Perm                    |                                                                                   | c0.34                                                                             |                                                                                   |                                                                                   | 0.14                                                                              |                                                                                   |                                                                                    | c0.09                                                                               |                                                                                     |                                                                                     | 0.09                                                                                | 0.12                                                                                |
| v/c Ratio                         |                                                                                   | 0.45                                                                              |                                                                                   |                                                                                   | 0.19                                                                              |                                                                                   |                                                                                    | 0.60                                                                                |                                                                                     |                                                                                     | 0.59                                                                                | 0.16                                                                                |
| Uniform Delay, d1                 |                                                                                   | 4.5                                                                               |                                                                                   |                                                                                   | 3.4                                                                               |                                                                                   |                                                                                    | 36.0                                                                                |                                                                                     |                                                                                     | 35.9                                                                                | 3.4                                                                                 |
| Progression Factor                |                                                                                   | 0.82                                                                              |                                                                                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                    | 1.00                                                                                |                                                                                     |                                                                                     | 0.92                                                                                | 1.23                                                                                |
| Incremental Delay, d2             |                                                                                   | 0.8                                                                               |                                                                                   |                                                                                   | 0.2                                                                               |                                                                                   |                                                                                    | 4.2                                                                                 |                                                                                     |                                                                                     | 3.7                                                                                 | 0.3                                                                                 |
| Delay (s)                         |                                                                                   | 4.4                                                                               |                                                                                   |                                                                                   | 3.6                                                                               |                                                                                   |                                                                                    | 40.2                                                                                |                                                                                     |                                                                                     | 36.7                                                                                | 4.5                                                                                 |
| Level of Service                  |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   | A                                                                                   |
| Approach Delay (s)                |                                                                                   | 4.4                                                                               |                                                                                   |                                                                                   | 3.6                                                                               |                                                                                   |                                                                                    | 40.2                                                                                |                                                                                     |                                                                                     | 16.7                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 10.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.48                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 68.7%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 6: Maryland Ave &amp; Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |  |                                                                                   |  |                                                                                    |  |  |  |  |                                                                                     |
| Traffic Volume (vph)              | 12                                                                                | 4                                                                                 | 2                                                                                 | 302                                                                               | 0                                                                                 | 80                                                                                | 0                                                                                  | 332                                                                                 | 415                                                                                 | 21                                                                                  | 308                                                                                 | 0                                                                                   |
| Future Volume (vph)               | 12                                                                                | 4                                                                                 | 2                                                                                 | 302                                                                               | 0                                                                                 | 80                                                                                | 0                                                                                  | 332                                                                                 | 415                                                                                 | 21                                                                                  | 308                                                                                 | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                    | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 0.99                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.97                                                                              |                                                                                    | 1.00                                                                                | 0.97                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.98                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.85                                                                              |                                                                                    | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 1579                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1376                                                                              |                                                                                    | 1676                                                                                | 1388                                                                                | 1593                                                                                | 1676                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 0.18                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 1579                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1376                                                                              |                                                                                    | 1676                                                                                | 1388                                                                                | 301                                                                                 | 1676                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                               | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                |
| Adj. Flow (vph)                   | 17                                                                                | 6                                                                                 | 3                                                                                 | 425                                                                               | 0                                                                                 | 113                                                                               | 0                                                                                  | 468                                                                                 | 585                                                                                 | 30                                                                                  | 434                                                                                 | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 3                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                  | 0                                                                                   | 469                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 23                                                                                | 0                                                                                 | 425                                                                               | 0                                                                                 | 36                                                                                | 0                                                                                  | 468                                                                                 | 116                                                                                 | 30                                                                                  | 434                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 5                                                                                 |                                                                                   | 5                                                                                 | 5                                                                                 |                                                                                   | 5                                                                                 | 5                                                                                  |                                                                                     | 8                                                                                   | 8                                                                                   |                                                                                     | 5                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                |                                                                                   | Prot                                                                              |                                                                                   | Perm                                                                              |                                                                                    | NA                                                                                  | Perm                                                                                | pm+pt                                                                               | NA                                                                                  |                                                                                     |
| Protected Phases                  | 3                                                                                 | 3                                                                                 |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   |                                                                                    | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 4                                                                                 |                                                                                    |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 2.6                                                                               |                                                                                   | 28.8                                                                              |                                                                                   | 28.8                                                                              |                                                                                    | 17.8                                                                                | 17.8                                                                                | 45.1                                                                                | 45.1                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 2.6                                                                               |                                                                                   | 28.8                                                                              |                                                                                   | 28.8                                                                              |                                                                                    | 17.8                                                                                | 17.8                                                                                | 45.1                                                                                | 45.1                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.03                                                                              |                                                                                   | 0.32                                                                              |                                                                                   | 0.32                                                                              |                                                                                    | 0.20                                                                                | 0.20                                                                                | 0.50                                                                                | 0.50                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                    | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 4.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                    | 5.0                                                                                 | 5.0                                                                                 | 3.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 45                                                                                |                                                                                   | 509                                                                               |                                                                                   | 440                                                                               |                                                                                    | 331                                                                                 | 274                                                                                 | 478                                                                                 | 839                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.01                                                                             |                                                                                   | c0.27                                                                             |                                                                                   |                                                                                   |                                                                                    | c0.28                                                                               |                                                                                     | 0.02                                                                                | c0.26                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.03                                                                              |                                                                                    |                                                                                     | 0.08                                                                                | 0.02                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.51                                                                              |                                                                                   | 0.83                                                                              |                                                                                   | 0.08                                                                              |                                                                                    | 1.41                                                                                | 0.42                                                                                | 0.06                                                                                | 0.52                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 43.1                                                                              |                                                                                   | 28.4                                                                              |                                                                                   | 21.4                                                                              |                                                                                    | 36.1                                                                                | 31.6                                                                                | 13.3                                                                                | 15.1                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   | 1.04                                                                              |                                                                                   | 2.57                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 12.5                                                                              |                                                                                   | 10.7                                                                              |                                                                                   | 0.0                                                                               |                                                                                    | 203.3                                                                               | 4.7                                                                                 | 0.3                                                                                 | 2.3                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 55.6                                                                              |                                                                                   | 40.2                                                                              |                                                                                   | 55.0                                                                              |                                                                                    | 239.4                                                                               | 36.3                                                                                | 13.6                                                                                | 17.4                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                    | F                                                                                   | D                                                                                   | B                                                                                   | B                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 55.6                                                                              |                                                                                   |                                                                                   | 43.3                                                                              |                                                                                   |                                                                                    | 126.6                                                                               |                                                                                     |                                                                                     | 17.1                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | F                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 79.8                                                                              |                                                                                   |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                          |                                                                                     |                                                                                     | E                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.88                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                               |                                                                                     |                                                                                     | 18.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 51.8%                                                                             |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                               |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
7: MD 355 & E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                | ↑                                                                                 | ↑↑                                                                                 | ↑↑↑                                                                                 |                                                                                     | ↑↑                                                                                  | ↑↑↑                                                                                 |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 591                                                                               | 238                                                                               | 0                                                                                 | 443                                                                               | 378                                                                               | 267                                                                                | 1003                                                                                | 0                                                                                   | 535                                                                                 | 847                                                                                 | 61                                                                                  |
| Future Volume (vph)               | 0                                                                                 | 591                                                                               | 238                                                                               | 0                                                                                 | 443                                                                               | 378                                                                               | 267                                                                                | 1003                                                                                | 0                                                                                   | 535                                                                                 | 847                                                                                 | 61                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              | 1.00                                                                              | 0.97                                                                               | 0.91                                                                                |                                                                                     | 0.97                                                                                | 0.91                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.96                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.99                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 3048                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4523                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 3048                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4523                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                               | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 603                                                                               | 243                                                                               | 0                                                                                 | 452                                                                               | 386                                                                               | 272                                                                                | 1023                                                                                | 0                                                                                   | 546                                                                                 | 864                                                                                 | 62                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 24                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 244                                                                               | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 4                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 822                                                                               | 0                                                                                 | 0                                                                                 | 452                                                                               | 142                                                                               | 272                                                                                | 1023                                                                                | 0                                                                                   | 546                                                                                 | 922                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 5                                                                                   |
| Turn Type                         |                                                                                   | NA                                                                                |                                                                                   |                                                                                   | NA                                                                                | Perm                                                                              | Prot                                                                               | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 1                                                                                  | 5                                                                                   |                                                                                     | 6                                                                                   | 2                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 51.0                                                                              |                                                                                   |                                                                                   | 51.0                                                                              | 51.0                                                                              | 25.0                                                                               | 76.0                                                                                |                                                                                     | 27.0                                                                                | 78.0                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 51.0                                                                              |                                                                                   |                                                                                   | 51.0                                                                              | 51.0                                                                              | 25.0                                                                               | 76.0                                                                                |                                                                                     | 27.0                                                                                | 78.0                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.28                                                                              |                                                                                   |                                                                                   | 0.28                                                                              | 0.28                                                                              | 0.14                                                                               | 0.42                                                                                |                                                                                     | 0.15                                                                                | 0.43                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 7.0                                                                                | 0.2                                                                                 |                                                                                     | 5.0                                                                                 | 0.2                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 863                                                                               |                                                                                   |                                                                                   | 902                                                                               | 403                                                                               | 429                                                                                | 1932                                                                                |                                                                                     | 463                                                                                 | 1959                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.27                                                                             |                                                                                   |                                                                                   | 0.14                                                                              |                                                                                   | 0.09                                                                               | c0.22                                                                               |                                                                                     | c0.18                                                                               | 0.20                                                                                |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.10                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.50                                                                              | 0.35                                                                              | 0.63                                                                               | 0.53                                                                                |                                                                                     | 1.18                                                                                | 0.47                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 63.3                                                                              |                                                                                   |                                                                                   | 53.9                                                                              | 51.4                                                                              | 73.2                                                                               | 38.7                                                                                |                                                                                     | 76.5                                                                                | 36.3                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 0.96                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 18.9                                                                              |                                                                                   |                                                                                   | 2.0                                                                               | 2.4                                                                               | 5.9                                                                                | 1.0                                                                                 |                                                                                     | 101.1                                                                               | 0.8                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 80.0                                                                              |                                                                                   |                                                                                   | 55.9                                                                              | 53.8                                                                              | 79.0                                                                               | 39.7                                                                                |                                                                                     | 177.6                                                                               | 37.1                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | D                                                                                 | E                                                                                  | D                                                                                   |                                                                                     | F                                                                                   | D                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 80.0                                                                              |                                                                                   |                                                                                   | 54.9                                                                              |                                                                                   |                                                                                    | 48.0                                                                                |                                                                                     |                                                                                     | 89.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | F                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 69.0                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | E                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.78                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 180.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 86.8%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | E                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Queuing and Blocking Report  
Existing Conditions

04/14/2023

## Intersection: 1: Monroe St &amp; E Middle Ln

| Movement              | EB  | EB  | WB  | WB  | NB |
|-----------------------|-----|-----|-----|-----|----|
| Directions Served     | T   | TR  | T   | T   | R  |
| Maximum Queue (ft)    | 29  | 6   | 25  | 12  | 46 |
| Average Queue (ft)    | 2   | 0   | 2   | 0   | 22 |
| 95th Queue (ft)       | 16  | 4   | 15  | 6   | 48 |
| Link Distance (ft)    | 640 | 640 | 187 | 187 |    |
| Upstream Blk Time (%) |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |
| Storage Bay Dist (ft) |     |     |     |     |    |
| Storage Blk Time (%)  |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |

## Intersection: 2: Monroe St &amp; E Montgomery Ave

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Intersection: 3: Monroe St &amp; Monroe Pl

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Existing Conditions

04/14/2023

## Intersection: 4: Monroe St &amp; E Jefferson St

| Movement              | EB  | EB  | EB  | WB  | WB  | WB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | T   | TR  | L   | T   | TR  | LT  | TR  | LT  | TR  |
| Maximum Queue (ft)    | 72  | 208 | 244 | 150 | 452 | 362 | 130 | 138 | 104 | 100 |
| Average Queue (ft)    | 33  | 82  | 116 | 68  | 162 | 181 | 68  | 74  | 40  | 43  |
| 95th Queue (ft)       | 63  | 151 | 204 | 150 | 355 | 339 | 116 | 129 | 85  | 88  |
| Link Distance (ft)    |     | 540 | 540 |     | 880 | 880 | 427 | 427 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 250 |     |     | 125 |     |     |     |     |     |     |
| Storage Blk Time (%)  |     | 0   |     | 0   | 9   |     |     |     |     |     |
| Queuing Penalty (veh) |     | 0   |     | 0   | 9   |     |     |     |     |     |

## Intersection: 5: Monroe St &amp; Fleet St

| Movement              | EB  | EB  | WB  | WB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LT  | TR  | LT  | TR  | LTR | LT  | R   |
| Maximum Queue (ft)    | 122 | 120 | 130 | 93  | 151 | 128 | 66  |
| Average Queue (ft)    | 60  | 55  | 53  | 34  | 73  | 52  | 22  |
| 95th Queue (ft)       | 109 | 106 | 108 | 75  | 127 | 101 | 51  |
| Link Distance (ft)    | 354 | 354 | 574 | 574 | 521 | 427 | 427 |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |

## Intersection: 6: Maryland Ave &amp; Fleet St

| Movement              | EB  | WB  | WB  | NB  | NB  | SB | SB  |
|-----------------------|-----|-----|-----|-----|-----|----|-----|
| Directions Served     | LTR | L   | R   | T   | R   | L  | T   |
| Maximum Queue (ft)    | 24  | 312 | 99  | 220 | 90  | 80 | 149 |
| Average Queue (ft)    | 3   | 165 | 38  | 118 | 23  | 28 | 50  |
| 95th Queue (ft)       | 17  | 262 | 73  | 195 | 69  | 63 | 108 |
| Link Distance (ft)    | 141 | 354 | 354 | 650 |     |    | 431 |
| Upstream Blk Time (%) |     | 0   |     |     |     |    |     |
| Queuing Penalty (veh) |     | 0   |     |     |     |    |     |
| Storage Bay Dist (ft) |     |     |     | 450 | 125 |    |     |
| Storage Blk Time (%)  |     |     |     |     |     | 0  | 1   |
| Queuing Penalty (veh) |     |     |     |     |     | 0  | 0   |

## Queuing and Blocking Report

### Existing Conditions

04/14/2023

#### Intersection: 7: MD 355 & E Jefferson St

| Movement              | EB  | EB  | WB  | WB  | WB  | NB  | NB  | NB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | T   | TR  | T   | T   | R   | L   | L   | T   | T   | T   | L   | L   |
| Maximum Queue (ft)    | 191 | 314 | 390 | 372 | 43  | 132 | 162 | 246 | 230 | 173 | 239 | 279 |
| Average Queue (ft)    | 99  | 114 | 246 | 221 | 4   | 39  | 83  | 154 | 137 | 72  | 120 | 164 |
| 95th Queue (ft)       | 164 | 232 | 358 | 334 | 25  | 113 | 145 | 228 | 211 | 162 | 217 | 248 |
| Link Distance (ft)    | 880 | 880 | 941 | 941 | 941 |     |     | 760 | 760 | 760 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     | 275 | 275 |     |     |     | 425 | 425 |
| Storage Blk Time (%)  |     |     |     |     |     |     |     | 0   |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     | 0   |     |     |     |     |

#### Intersection: 7: MD 355 & E Jefferson St

| Movement              | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | T   | T   | TR  |
| Maximum Queue (ft)    | 355 | 357 | 302 |
| Average Queue (ft)    | 246 | 237 | 177 |
| 95th Queue (ft)       | 333 | 321 | 276 |
| Link Distance (ft)    | 658 | 658 | 658 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  | 0   |     |     |
| Queuing Penalty (veh) | 0   |     |     |

## Network Summary

Network wide Queuing Penalty: 10

## Queuing and Blocking Report

### Existing Conditions

04/14/2023

#### Intersection: 1: Monroe St & E Middle Ln

| Movement              | EB  | EB  | WB  | WB  | NB |
|-----------------------|-----|-----|-----|-----|----|
| Directions Served     | T   | TR  | T   | T   | R  |
| Maximum Queue (ft)    | 29  | 28  | 39  | 6   | 55 |
| Average Queue (ft)    | 3   | 1   | 2   | 0   | 26 |
| 95th Queue (ft)       | 20  | 12  | 17  | 4   | 49 |
| Link Distance (ft)    | 640 | 640 | 187 | 187 |    |
| Upstream Blk Time (%) |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |
| Storage Bay Dist (ft) |     |     |     |     |    |
| Storage Blk Time (%)  |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |

#### Intersection: 2: Monroe St & E Montgomery Ave

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

#### Intersection: 3: Monroe St & Monroe Pl

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Existing Conditions

04/14/2023

## Intersection: 4: Monroe St &amp; E Jefferson St

| Movement              | EB  | EB  | EB  | WB  | WB  | WB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | T   | TR  | L   | T   | TR  | LT  | TR  | LT  | TR  |
| Maximum Queue (ft)    | 66  | 236 | 247 | 149 | 315 | 342 | 154 | 224 | 138 | 171 |
| Average Queue (ft)    | 26  | 133 | 129 | 57  | 203 | 220 | 78  | 129 | 62  | 88  |
| 95th Queue (ft)       | 58  | 211 | 217 | 145 | 315 | 327 | 133 | 195 | 125 | 154 |
| Link Distance (ft)    |     | 540 | 540 |     | 880 | 880 | 427 | 427 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 250 |     |     | 125 |     |     |     |     |     |     |
| Storage Blk Time (%)  |     | 0   |     | 0   | 14  |     |     |     |     |     |
| Queuing Penalty (veh) |     | 0   |     | 0   | 7   |     |     |     |     |     |

## Intersection: 5: Monroe St &amp; Fleet St

| Movement              | EB  | EB  | WB  | WB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LT  | TR  | LT  | TR  | LTR | LT  | R   |
| Maximum Queue (ft)    | 114 | 94  | 89  | 70  | 126 | 124 | 78  |
| Average Queue (ft)    | 41  | 35  | 32  | 19  | 58  | 49  | 27  |
| 95th Queue (ft)       | 86  | 78  | 72  | 54  | 103 | 103 | 62  |
| Link Distance (ft)    | 354 | 354 | 574 | 574 | 521 | 427 | 427 |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |

## Intersection: 6: Maryland Ave &amp; Fleet St

| Movement              | EB  | WB  | WB  | NB  | NB  | SB | SB  |
|-----------------------|-----|-----|-----|-----|-----|----|-----|
| Directions Served     | LTR | L   | R   | T   | R   | L  | T   |
| Maximum Queue (ft)    | 50  | 302 | 90  | 450 | 226 | 34 | 155 |
| Average Queue (ft)    | 12  | 164 | 38  | 222 | 33  | 9  | 62  |
| 95th Queue (ft)       | 38  | 260 | 70  | 411 | 208 | 29 | 131 |
| Link Distance (ft)    | 141 | 354 | 354 | 650 |     |    | 431 |
| Upstream Blk Time (%) |     | 0   |     | 0   |     |    |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |    |     |
| Storage Bay Dist (ft) |     |     |     | 450 | 125 |    |     |
| Storage Blk Time (%)  |     |     |     | 1   | 0   |    | 1   |
| Queuing Penalty (veh) |     |     |     | 5   | 0   |    | 0   |



Queuing and Blocking Report  
Existing Conditions

04/14/2023

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | EB  | EB  | WB  | WB  | WB  | NB  | NB  | NB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | T   | TR  | T   | T   | R   | L   | L   | T   | T   | T   | L   | L   |
| Maximum Queue (ft)    | 462 | 522 | 251 | 258 | 102 | 241 | 300 | 441 | 394 | 287 | 437 | 450 |
| Average Queue (ft)    | 277 | 320 | 155 | 134 | 18  | 90  | 168 | 270 | 244 | 186 | 431 | 447 |
| 95th Queue (ft)       | 423 | 476 | 233 | 227 | 67  | 193 | 302 | 400 | 357 | 283 | 464 | 465 |
| Link Distance (ft)    | 880 | 880 | 941 | 941 | 941 |     |     | 760 | 760 | 760 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     | 275 | 275 |     |     |     | 425 | 425 |
| Storage Blk Time (%)  |     |     |     |     |     | 0   | 0   | 6   |     |     | 17  | 72  |
| Queuing Penalty (veh) |     |     |     |     |     | 0   | 1   | 17  |     |     | 47  | 202 |

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | T   | T   | TR  |
| Maximum Queue (ft)    | 712 | 648 | 436 |
| Average Queue (ft)    | 653 | 420 | 256 |
| 95th Queue (ft)       | 809 | 688 | 410 |
| Link Distance (ft)    | 658 | 658 | 658 |
| Upstream Blk Time (%) | 69  | 0   |     |
| Queuing Penalty (veh) | 0   | 0   |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  | 1   |     |     |
| Queuing Penalty (veh) | 4   |     |     |

## Network Summary

Network wide Queuing Penalty: 284

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
1: Monroe St & E Middle Ln

04/14/2023

|                                   |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |                                                                                   |  |
| Traffic Volume (veh/h)            | 229                                                                               | 14                                                                                | 0                                                                                 | 350                                                                               | 0                                                                                 | 42                                                                                |
| Future Volume (Veh/h)             | 229                                                                               | 14                                                                                | 0                                                                                 | 350                                                                               | 0                                                                                 | 42                                                                                |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              |
| Hourly flow rate (vph)            | 266                                                                               | 16                                                                                | 0                                                                                 | 407                                                                               | 0                                                                                 | 49                                                                                |
| Pedestrians                       | 11                                                                                |                                                                                   |                                                                                   | 1                                                                                 | 29                                                                                |                                                                                   |
| Lane Width (ft)                   | 12.0                                                                              |                                                                                   |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   |
| Walking Speed (ft/s)              | 3.5                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   |
| Percent Blockage                  | 1                                                                                 |                                                                                   |                                                                                   | 0                                                                                 | 3                                                                                 |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   | 311                                                                               |                                                                                   | 518                                                                               | 171                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 311                                                                               |                                                                                   | 518                                                                               | 171                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   | 6.8                                                                               | 6.9                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   | 100                                                                               |                                                                                   | 100                                                                               | 94                                                                                |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 1212                                                                              |                                                                                   | 469                                                                               | 819                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1                                                                              | WB 2                                                                              | NB 1                                                                              |                                                                                   |
| Volume Total                      | 177                                                                               | 105                                                                               | 204                                                                               | 204                                                                               | 49                                                                                |                                                                                   |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |
| Volume Right                      | 0                                                                                 | 16                                                                                | 0                                                                                 | 0                                                                                 | 49                                                                                |                                                                                   |
| cSH                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 819                                                                               |                                                                                   |
| Volume to Capacity                | 0.10                                                                              | 0.06                                                                              | 0.12                                                                              | 0.12                                                                              | 0.06                                                                              |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 5                                                                                 |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 9.7                                                                               |                                                                                   |
| Lane LOS                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 9.7                                                                               |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.6                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 21.5%                                                                             |                                                                                   | ICU Level of Service                                                              | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
2: Monroe St & E Montgomery Ave

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              | Stop                                                                              |                                                                                   |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 3.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 917                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              | A                                                                                 |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
3: Monroe St & Monroe PI

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
|                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |  |  |  |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                    |  |  |                                                                                     |  |                                                                                     |  |  |  |  |  |  |  |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                    | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |  |  |  |  |  |  |  |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 4.5                                                                               | 4.5                                                                               | 4.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 806                                                                               | 806                                                                               | 900                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.3                                                                               | 6.3                                                                               | 7.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 4: Monroe St &amp; E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 69                                                                                | 568                                                                               | 64                                                                                | 96                                                                                | 674                                                                               | 56                                                                                | 70                                                                                 | 135                                                                                 | 71                                                                                  | 15                                                                                  | 78                                                                                  | 41                                                                                  |
| Future Volume (vph)               | 69                                                                                | 568                                                                               | 64                                                                                | 96                                                                                | 674                                                                               | 56                                                                                | 70                                                                                 | 135                                                                                 | 71                                                                                  | 15                                                                                  | 78                                                                                  | 41                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   | 6.0                                                                                | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 0.97                                                                                |                                                                                     | 1.00                                                                                | 0.97                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                               | 0.95                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1591                                                                              | 3123                                                                              |                                                                                   | 1589                                                                              | 3140                                                                              |                                                                                   | 1479                                                                               | 1546                                                                                |                                                                                     | 1517                                                                                | 1537                                                                                |                                                                                     |
| Flt Permitted                     | 0.30                                                                              | 1.00                                                                              |                                                                                   | 0.34                                                                              | 1.00                                                                              |                                                                                   | 0.68                                                                               | 1.00                                                                                |                                                                                     | 0.53                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 494                                                                               | 3123                                                                              |                                                                                   | 563                                                                               | 3140                                                                              |                                                                                   | 1052                                                                               | 1546                                                                                |                                                                                     | 850                                                                                 | 1537                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                               | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                |
| Adj. Flow (vph)                   | 73                                                                                | 604                                                                               | 68                                                                                | 102                                                                               | 717                                                                               | 60                                                                                | 74                                                                                 | 144                                                                                 | 76                                                                                  | 16                                                                                  | 83                                                                                  | 44                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 73                                                                                | 672                                                                               | 0                                                                                 | 102                                                                               | 777                                                                               | 0                                                                                 | 74                                                                                 | 220                                                                                 | 0                                                                                   | 16                                                                                  | 127                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 8                                                                                 |                                                                                   | 16                                                                                | 16                                                                                |                                                                                   | 8                                                                                 | 66                                                                                 |                                                                                     | 59                                                                                  | 59                                                                                  |                                                                                     | 66                                                                                  |
| Turn Type                         | pm+pt                                                                             | NA                                                                                |                                                                                   | pm+pt                                                                             | NA                                                                                |                                                                                   | Perm                                                                               | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  | 1                                                                                 | 6                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                 |                                                                                   |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                  |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 49.2                                                                              | 43.1                                                                              |                                                                                   | 50.4                                                                              | 43.7                                                                              |                                                                                   | 23.2                                                                               | 23.2                                                                                |                                                                                     | 23.2                                                                                | 23.2                                                                                |                                                                                     |
| Effective Green, g (s)            | 49.2                                                                              | 43.1                                                                              |                                                                                   | 50.4                                                                              | 43.7                                                                              |                                                                                   | 23.2                                                                               | 23.2                                                                                |                                                                                     | 23.2                                                                                | 23.2                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.55                                                                              | 0.48                                                                              |                                                                                   | 0.56                                                                              | 0.49                                                                              |                                                                                   | 0.26                                                                               | 0.26                                                                                |                                                                                     | 0.26                                                                                | 0.26                                                                                |                                                                                     |
| Clearance Time (s)                | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   | 6.0                                                                                | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 344                                                                               | 1495                                                                              |                                                                                   | 391                                                                               | 1524                                                                              |                                                                                   | 271                                                                                | 398                                                                                 |                                                                                     | 219                                                                                 | 396                                                                                 |                                                                                     |
| v/s Ratio Prot                    | 0.01                                                                              | 0.22                                                                              |                                                                                   | c0.02                                                                             | c0.25                                                                             |                                                                                   |                                                                                    | c0.14                                                                               |                                                                                     |                                                                                     | 0.08                                                                                |                                                                                     |
| v/s Ratio Perm                    | 0.10                                                                              |                                                                                   |                                                                                   | 0.13                                                                              |                                                                                   |                                                                                   | 0.07                                                                               |                                                                                     |                                                                                     | 0.02                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.21                                                                              | 0.45                                                                              |                                                                                   | 0.26                                                                              | 0.51                                                                              |                                                                                   | 0.27                                                                               | 0.55                                                                                |                                                                                     | 0.07                                                                                | 0.32                                                                                |                                                                                     |
| Uniform Delay, d1                 | 10.0                                                                              | 15.6                                                                              |                                                                                   | 9.6                                                                               | 15.8                                                                              |                                                                                   | 26.7                                                                               | 28.9                                                                                |                                                                                     | 25.3                                                                                | 27.0                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.83                                                                               | 0.84                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 0.3                                                                               | 1.0                                                                               |                                                                                   | 0.4                                                                               | 1.2                                                                               |                                                                                   | 0.5                                                                                | 1.5                                                                                 |                                                                                     | 0.1                                                                                 | 0.5                                                                                 |                                                                                     |
| Delay (s)                         | 10.4                                                                              | 16.6                                                                              |                                                                                   | 10.0                                                                              | 17.0                                                                              |                                                                                   | 22.7                                                                               | 25.9                                                                                |                                                                                     | 25.4                                                                                | 27.5                                                                                |                                                                                     |
| Level of Service                  | B                                                                                 | B                                                                                 |                                                                                   | A                                                                                 | B                                                                                 |                                                                                   | C                                                                                  | C                                                                                   |                                                                                     | C                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 15.9                                                                              |                                                                                   |                                                                                   | 16.2                                                                              |                                                                                   |                                                                                    | 25.1                                                                                |                                                                                     |                                                                                     | 27.3                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 18.1                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.50                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 17.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 64.2%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
5: Monroe St & Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |                                                                                   |    |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 148                                                                               | 314                                                                               | 62                                                                                | 10                                                                                | 275                                                                               | 81                                                                                | 43                                                                                | 69                                                                                  | 21                                                                                  | 43                                                                                  | 43                                                                                  | 83                                                                                  |
| Future Volume (vph)               | 148                                                                               | 314                                                                               | 62                                                                                | 10                                                                                | 275                                                                               | 81                                                                                | 43                                                                                | 69                                                                                  | 21                                                                                  | 43                                                                                  | 43                                                                                  | 83                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.93                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.98                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.97                                                                              |                                                                                   |                                                                                   | 0.98                                                                                |                                                                                     | 1.00                                                                                | 0.90                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.98                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1567                                                                              | 1618                                                                              |                                                                                   | 1567                                                                              | 1597                                                                              |                                                                                   |                                                                                   | 1576                                                                                |                                                                                     | 1582                                                                                | 1407                                                                                |                                                                                     |
| Flt Permitted                     | 0.41                                                                              | 1.00                                                                              |                                                                                   | 0.39                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.69                                                                                |                                                                                     | 0.52                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 676                                                                               | 1618                                                                              |                                                                                   | 646                                                                               | 1597                                                                              |                                                                                   |                                                                                   | 1112                                                                                |                                                                                     | 873                                                                                 | 1407                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                |
| Adj. Flow (vph)                   | 224                                                                               | 476                                                                               | 94                                                                                | 15                                                                                | 417                                                                               | 123                                                                               | 65                                                                                | 105                                                                                 | 32                                                                                  | 65                                                                                  | 65                                                                                  | 126                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 6                                                                                 | 0                                                                                 | 0                                                                                 | 8                                                                                 | 0                                                                                 | 0                                                                                 | 9                                                                                   | 0                                                                                   | 0                                                                                   | 91                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 224                                                                               | 564                                                                               | 0                                                                                 | 15                                                                                | 532                                                                               | 0                                                                                 | 0                                                                                 | 193                                                                                 | 0                                                                                   | 65                                                                                  | 100                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 20                                                                                |                                                                                   | 19                                                                                | 19                                                                                |                                                                                   | 20                                                                                | 40                                                                                |                                                                                     | 5                                                                                   | 5                                                                                   |                                                                                     | 40                                                                                  |
| Turn Type                         | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 61.9                                                                              | 61.9                                                                              |                                                                                   | 61.9                                                                              | 61.9                                                                              |                                                                                   |                                                                                   | 18.1                                                                                |                                                                                     | 18.1                                                                                | 18.1                                                                                |                                                                                     |
| Effective Green, g (s)            | 61.9                                                                              | 61.9                                                                              |                                                                                   | 61.9                                                                              | 61.9                                                                              |                                                                                   |                                                                                   | 18.1                                                                                |                                                                                     | 18.1                                                                                | 18.1                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.69                                                                              | 0.69                                                                              |                                                                                   | 0.69                                                                              | 0.69                                                                              |                                                                                   |                                                                                   | 0.20                                                                                |                                                                                     | 0.20                                                                                | 0.20                                                                                |                                                                                     |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |                                                                                   | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 464                                                                               | 1112                                                                              |                                                                                   | 444                                                                               | 1098                                                                              |                                                                                   |                                                                                   | 223                                                                                 |                                                                                     | 175                                                                                 | 282                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.35                                                                             |                                                                                   |                                                                                   | 0.33                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     | 0.07                                                                                |                                                                                     |
| v/s Ratio Perm                    | 0.33                                                                              |                                                                                   |                                                                                   | 0.02                                                                              |                                                                                   |                                                                                   |                                                                                   | c0.17                                                                               |                                                                                     | 0.07                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.48                                                                              | 0.51                                                                              |                                                                                   | 0.03                                                                              | 0.48                                                                              |                                                                                   |                                                                                   | 0.87                                                                                |                                                                                     | 0.37                                                                                | 0.35                                                                                |                                                                                     |
| Uniform Delay, d1                 | 6.6                                                                               | 6.7                                                                               |                                                                                   | 4.5                                                                               | 6.6                                                                               |                                                                                   |                                                                                   | 34.8                                                                                |                                                                                     | 31.0                                                                                | 30.9                                                                                |                                                                                     |
| Progression Factor                | 0.85                                                                              | 0.84                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 0.98                                                                                | 0.98                                                                                |                                                                                     |
| Incremental Delay, d2             | 3.1                                                                               | 1.4                                                                               |                                                                                   | 0.1                                                                               | 1.5                                                                               |                                                                                   |                                                                                   | 27.8                                                                                |                                                                                     | 1.3                                                                                 | 0.7                                                                                 |                                                                                     |
| Delay (s)                         | 8.7                                                                               | 7.1                                                                               |                                                                                   | 4.6                                                                               | 8.1                                                                               |                                                                                   |                                                                                   | 62.6                                                                                |                                                                                     | 31.6                                                                                | 30.9                                                                                |                                                                                     |
| Level of Service                  | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   | E                                                                                   |                                                                                     | C                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 7.5                                                                               |                                                                                   |                                                                                   | 8.0                                                                               |                                                                                   |                                                                                   | 62.6                                                                                |                                                                                     |                                                                                     | 31.1                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | E                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 17.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Level of Service         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.59                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | 10.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 85.6%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| ICU Level of Service              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | E                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 6: Maryland Ave &amp; Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |  |                                                                                   |  |                                                                                   |  |  |  |  |                                                                                     |
| Traffic Volume (vph)              | 2                                                                                 | 1                                                                                 | 1                                                                                 | 315                                                                               | 0                                                                                 | 101                                                                               | 0                                                                                 | 276                                                                                 | 451                                                                                 | 87                                                                                  | 245                                                                                 | 0                                                                                   |
| Future Volume (vph)               | 2                                                                                 | 1                                                                                 | 1                                                                                 | 315                                                                               | 0                                                                                 | 101                                                                               | 0                                                                                 | 276                                                                                 | 451                                                                                 | 87                                                                                  | 245                                                                                 | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 0.98                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.97                                                                              |                                                                                   | 1.00                                                                                | 0.97                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.97                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.85                                                                              |                                                                                   | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 1545                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1384                                                                              |                                                                                   | 1676                                                                                | 1388                                                                                | 1593                                                                                | 1676                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.27                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 1545                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1384                                                                              |                                                                                   | 1676                                                                                | 1388                                                                                | 456                                                                                 | 1676                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                |
| Adj. Flow (vph)                   | 3                                                                                 | 1                                                                                 | 1                                                                                 | 399                                                                               | 0                                                                                 | 128                                                                               | 0                                                                                 | 349                                                                                 | 571                                                                                 | 110                                                                                 | 310                                                                                 | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 88                                                                                | 0                                                                                 | 0                                                                                   | 407                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 4                                                                                 | 0                                                                                 | 399                                                                               | 0                                                                                 | 40                                                                                | 0                                                                                 | 349                                                                                 | 164                                                                                 | 110                                                                                 | 310                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 3                                                                                 |                                                                                   | 3                                                                                 | 3                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 |                                                                                     | 2                                                                                   | 2                                                                                   |                                                                                     | 7                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                |                                                                                   | Prot                                                                              |                                                                                   | Perm                                                                              |                                                                                   | NA                                                                                  | Perm                                                                                | pm+pt                                                                               | NA                                                                                  |                                                                                     |
| Protected Phases                  | 3                                                                                 | 3                                                                                 |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   |                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 4                                                                                 |                                                                                   |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 1.3                                                                               |                                                                                   | 28.0                                                                              |                                                                                   | 28.0                                                                              |                                                                                   | 25.9                                                                                | 25.9                                                                                | 47.2                                                                                | 47.2                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 1.3                                                                               |                                                                                   | 28.0                                                                              |                                                                                   | 28.0                                                                              |                                                                                   | 25.9                                                                                | 25.9                                                                                | 47.2                                                                                | 47.2                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.01                                                                              |                                                                                   | 0.31                                                                              |                                                                                   | 0.31                                                                              |                                                                                   | 0.29                                                                                | 0.29                                                                                | 0.52                                                                                | 0.52                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 4.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 5.0                                                                                 | 5.0                                                                                 | 3.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 22                                                                                |                                                                                   | 495                                                                               |                                                                                   | 430                                                                               |                                                                                   | 482                                                                                 | 399                                                                                 | 451                                                                                 | 878                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.00                                                                             |                                                                                   | c0.25                                                                             |                                                                                   |                                                                                   |                                                                                   | c0.21                                                                               |                                                                                     | 0.05                                                                                | c0.18                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.03                                                                              |                                                                                   |                                                                                     | 0.12                                                                                | 0.08                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.18                                                                              |                                                                                   | 0.81                                                                              |                                                                                   | 0.09                                                                              |                                                                                   | 0.72                                                                                | 0.41                                                                                | 0.24                                                                                | 0.35                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 43.8                                                                              |                                                                                   | 28.5                                                                              |                                                                                   | 22.0                                                                              |                                                                                   | 28.8                                                                                | 25.9                                                                                | 12.4                                                                                | 12.5                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   | 1.04                                                                              |                                                                                   | 1.41                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 5.4                                                                               |                                                                                   | 8.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 9.1                                                                                 | 3.1                                                                                 | 1.3                                                                                 | 1.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 49.2                                                                              |                                                                                   | 37.7                                                                              |                                                                                   | 31.0                                                                              |                                                                                   | 38.0                                                                                | 29.0                                                                                | 13.7                                                                                | 13.6                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   | C                                                                                 |                                                                                   | D                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 49.2                                                                              |                                                                                   |                                                                                   | 36.1                                                                              |                                                                                   |                                                                                   | 32.4                                                                                |                                                                                     |                                                                                     | 13.6                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 29.3                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                     | 18.0                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 58.4%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
7: MD 355 & E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                | ↑                                                                                 | ↑↑                                                                                 | ↑↑↑                                                                                 |                                                                                     | ↑↑                                                                                  | ↑↑↑                                                                                 |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 307                                                                               | 305                                                                               | 0                                                                                 | 683                                                                               | 387                                                                               | 170                                                                                | 525                                                                                 | 0                                                                                   | 325                                                                                 | 1208                                                                                | 49                                                                                  |
| Future Volume (vph)               | 0                                                                                 | 307                                                                               | 305                                                                               | 0                                                                                 | 683                                                                               | 387                                                                               | 170                                                                                | 525                                                                                 | 0                                                                                   | 325                                                                                 | 1208                                                                                | 49                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              | 1.00                                                                              | 0.97                                                                               | 0.91                                                                                |                                                                                     | 0.97                                                                                | 0.91                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.93                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.99                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 2947                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4544                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 2947                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4544                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                               | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 313                                                                               | 311                                                                               | 0                                                                                 | 697                                                                               | 395                                                                               | 173                                                                                | 536                                                                                 | 0                                                                                   | 332                                                                                 | 1233                                                                                | 50                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 120                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 284                                                                               | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 3                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 504                                                                               | 0                                                                                 | 0                                                                                 | 697                                                                               | 111                                                                               | 173                                                                                | 536                                                                                 | 0                                                                                   | 332                                                                                 | 1280                                                                                | 0                                                                                   |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 10                                                                                  |
| Turn Type                         |                                                                                   | NA                                                                                |                                                                                   |                                                                                   | NA                                                                                | Perm                                                                              | Prot                                                                               | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 1                                                                                  | 5                                                                                   |                                                                                     | 6                                                                                   | 2                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 38.0                                                                              |                                                                                   |                                                                                   | 38.0                                                                              | 38.0                                                                              | 13.0                                                                               | 45.0                                                                                |                                                                                     | 41.0                                                                                | 73.0                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 38.0                                                                              |                                                                                   |                                                                                   | 38.0                                                                              | 38.0                                                                              | 13.0                                                                               | 45.0                                                                                |                                                                                     | 41.0                                                                                | 73.0                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.25                                                                              |                                                                                   |                                                                                   | 0.25                                                                              | 0.25                                                                              | 0.09                                                                               | 0.30                                                                                |                                                                                     | 0.27                                                                                | 0.49                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 7.0                                                                                | 0.2                                                                                 |                                                                                     | 5.0                                                                                 | 0.2                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 746                                                                               |                                                                                   |                                                                                   | 806                                                                               | 361                                                                               | 267                                                                                | 1373                                                                                |                                                                                     | 844                                                                                 | 2211                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | 0.17                                                                              |                                                                                   |                                                                                   | c0.22                                                                             |                                                                                   | c0.06                                                                              | 0.12                                                                                |                                                                                     | 0.11                                                                                | c0.28                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.08                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.68                                                                              |                                                                                   |                                                                                   | 0.86                                                                              | 0.31                                                                              | 0.65                                                                               | 0.39                                                                                |                                                                                     | 0.39                                                                                | 0.58                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 50.4                                                                              |                                                                                   |                                                                                   | 53.5                                                                              | 45.3                                                                              | 66.3                                                                               | 41.6                                                                                |                                                                                     | 44.4                                                                                | 27.5                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 4.9                                                                               |                                                                                   |                                                                                   | 11.9                                                                              | 2.2                                                                               | 9.9                                                                                | 0.8                                                                                 |                                                                                     | 1.4                                                                                 | 1.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 55.3                                                                              |                                                                                   |                                                                                   | 65.5                                                                              | 47.5                                                                              | 76.2                                                                               | 42.5                                                                                |                                                                                     | 45.8                                                                                | 28.6                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | D                                                                                 | E                                                                                  | D                                                                                   |                                                                                     | D                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 55.3                                                                              |                                                                                   |                                                                                   | 59.0                                                                              |                                                                                   |                                                                                    | 50.7                                                                                |                                                                                     |                                                                                     | 32.1                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 46.2                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 150.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 75.2%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
1: Monroe St & E Middle Ln

04/14/2023

|                                   |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                |                                                                                   | ↑                                                                                 |
| Traffic Volume (veh/h)            | 435                                                                               | 4                                                                                 | 0                                                                                 | 322                                                                               | 0                                                                                 | 51                                                                                |
| Future Volume (Veh/h)             | 435                                                                               | 4                                                                                 | 0                                                                                 | 322                                                                               | 0                                                                                 | 51                                                                                |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              |
| Hourly flow rate (vph)            | 500                                                                               | 5                                                                                 | 0                                                                                 | 370                                                                               | 0                                                                                 | 59                                                                                |
| Pedestrians                       | 12                                                                                |                                                                                   |                                                                                   | 2                                                                                 | 38                                                                                |                                                                                   |
| Lane Width (ft)                   | 12.0                                                                              |                                                                                   |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   |
| Walking Speed (ft/s)              | 3.5                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   |
| Percent Blockage                  | 1                                                                                 |                                                                                   |                                                                                   | 0                                                                                 | 4                                                                                 |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   | 543                                                                               |                                                                                   | 738                                                                               | 292                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 543                                                                               |                                                                                   | 738                                                                               | 292                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   | 6.8                                                                               | 6.9                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   | 100                                                                               |                                                                                   | 100                                                                               | 91                                                                                |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 985                                                                               |                                                                                   | 337                                                                               | 677                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1                                                                              | WB 2                                                                              | NB 1                                                                              |                                                                                   |
| Volume Total                      | 333                                                                               | 172                                                                               | 185                                                                               | 185                                                                               | 59                                                                                |                                                                                   |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |
| Volume Right                      | 0                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                 | 59                                                                                |                                                                                   |
| cSH                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 677                                                                               |                                                                                   |
| Volume to Capacity                | 0.20                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.09                                                                              |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 7                                                                                 |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 10.8                                                                              |                                                                                   |
| Lane LOS                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 10.8                                                                              |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.7                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 24.5%                                                                             |                                                                                   | ICU Level of Service                                                              | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
2: Monroe St & E Montgomery Ave

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              | Stop                                                                              |                                                                                   |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 3.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 917                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              | A                                                                                 |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

ATTACHMENT A

# HCM Unsignalized Intersection Capacity Analysis 3: Monroe St & Monroe PI

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                    |  |  |                                                                                     |  |                                                                                     |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                    | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 4.5                                                                               | 4.5                                                                               | 4.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 806                                                                               | 806                                                                               | 900                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.3                                                                               | 6.3                                                                               | 7.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 4: Monroe St &amp; E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 47                                                                                | 744                                                                               | 37                                                                                | 53                                                                                | 652                                                                               | 30                                                                                | 65                                                                                  | 106                                                                                 | 183                                                                                 | 62                                                                                  | 97                                                                                  | 96                                                                                  |
| Future Volume (vph)               | 47                                                                                | 744                                                                               | 37                                                                                | 53                                                                                | 652                                                                               | 30                                                                                | 65                                                                                  | 106                                                                                 | 183                                                                                 | 62                                                                                  | 97                                                                                  | 96                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                                | 0.96                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                                | 0.90                                                                                |                                                                                     | 1.00                                                                                | 0.93                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1591                                                                              | 3156                                                                              |                                                                                   | 1590                                                                              | 3159                                                                              |                                                                                   | 1482                                                                                | 1451                                                                                |                                                                                     | 1543                                                                                | 1467                                                                                |                                                                                     |
| Flt Permitted                     | 0.32                                                                              | 1.00                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                              |                                                                                   | 0.57                                                                                | 1.00                                                                                |                                                                                     | 0.40                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 532                                                                               | 3156                                                                              |                                                                                   | 411                                                                               | 3159                                                                              |                                                                                   | 881                                                                                 | 1451                                                                                |                                                                                     | 645                                                                                 | 1467                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 51                                                                                | 809                                                                               | 40                                                                                | 58                                                                                | 709                                                                               | 33                                                                                | 71                                                                                  | 115                                                                                 | 199                                                                                 | 67                                                                                  | 105                                                                                 | 104                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 51                                                                                | 849                                                                               | 0                                                                                 | 58                                                                                | 742                                                                               | 0                                                                                 | 71                                                                                  | 314                                                                                 | 0                                                                                   | 67                                                                                  | 209                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 8                                                                                 |                                                                                   | 19                                                                                | 19                                                                                |                                                                                   | 8                                                                                 | 77                                                                                  |                                                                                     | 49                                                                                  | 49                                                                                  |                                                                                     | 77                                                                                  |
| Turn Type                         | pm+pt                                                                             | NA                                                                                |                                                                                   | pm+pt                                                                             | NA                                                                                |                                                                                   | Perm                                                                                | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  | 1                                                                                 | 6                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                 |                                                                                   |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 46.4                                                                              | 42.5                                                                              |                                                                                   | 49.0                                                                              | 43.8                                                                              |                                                                                   | 25.3                                                                                | 25.3                                                                                |                                                                                     | 25.3                                                                                | 25.3                                                                                |                                                                                     |
| Effective Green, g (s)            | 46.4                                                                              | 42.5                                                                              |                                                                                   | 49.0                                                                              | 43.8                                                                              |                                                                                   | 25.3                                                                                | 25.3                                                                                |                                                                                     | 25.3                                                                                | 25.3                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.52                                                                              | 0.47                                                                              |                                                                                   | 0.54                                                                              | 0.49                                                                              |                                                                                   | 0.28                                                                                | 0.28                                                                                |                                                                                     | 0.28                                                                                | 0.28                                                                                |                                                                                     |
| Clearance Time (s)                | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 320                                                                               | 1490                                                                              |                                                                                   | 291                                                                               | 1537                                                                              |                                                                                   | 247                                                                                 | 407                                                                                 |                                                                                     | 181                                                                                 | 412                                                                                 |                                                                                     |
| v/s Ratio Prot                    | 0.01                                                                              | c0.27                                                                             |                                                                                   | c0.01                                                                             | 0.23                                                                              |                                                                                   |                                                                                     | c0.22                                                                               |                                                                                     |                                                                                     | 0.14                                                                                |                                                                                     |
| v/s Ratio Perm                    | 0.08                                                                              |                                                                                   |                                                                                   | 0.10                                                                              |                                                                                   |                                                                                   | 0.08                                                                                |                                                                                     |                                                                                     | 0.10                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.16                                                                              | 0.57                                                                              |                                                                                   | 0.20                                                                              | 0.48                                                                              |                                                                                   | 0.29                                                                                | 0.77                                                                                |                                                                                     | 0.37                                                                                | 0.51                                                                                |                                                                                     |
| Uniform Delay, d1                 | 11.1                                                                              | 17.1                                                                              |                                                                                   | 10.5                                                                              | 15.5                                                                              |                                                                                   | 25.3                                                                                | 29.7                                                                                |                                                                                     | 26.0                                                                                | 27.1                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.44                                                                              | 1.79                                                                              |                                                                                   | 0.82                                                                                | 0.89                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 0.2                                                                               | 1.6                                                                               |                                                                                   | 0.3                                                                               | 1.0                                                                               |                                                                                   | 0.6                                                                                 | 8.2                                                                                 |                                                                                     | 1.3                                                                                 | 1.0                                                                                 |                                                                                     |
| Delay (s)                         | 11.4                                                                              | 18.7                                                                              |                                                                                   | 15.4                                                                              | 28.8                                                                              |                                                                                   | 21.3                                                                                | 34.6                                                                                |                                                                                     | 27.2                                                                                | 28.1                                                                                |                                                                                     |
| Level of Service                  | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | C                                                                                   | C                                                                                   |                                                                                     | C                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 18.3                                                                              |                                                                                   |                                                                                   | 27.8                                                                              |                                                                                   |                                                                                     | 32.1                                                                                |                                                                                     |                                                                                     | 27.9                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 24.9                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.61                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                     | 17.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 79.5%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
5: Monroe St & Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |                                                                                   |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 157                                                                               | 189                                                                               | 83                                                                                | 13                                                                                | 180                                                                               | 44                                                                                | 11                                                                                | 66                                                                                  | 7                                                                                   | 9                                                                                   | 73                                                                                  | 134                                                                                 |
| Future Volume (vph)               | 157                                                                               | 189                                                                               | 83                                                                                | 13                                                                                | 180                                                                               | 44                                                                                | 11                                                                                | 66                                                                                  | 7                                                                                   | 9                                                                                   | 73                                                                                  | 134                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   |                                                                                   | 0.99                                                                                |                                                                                     | 1.00                                                                                | 0.98                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.97                                                                              |                                                                                   |                                                                                   | 0.99                                                                                |                                                                                     | 1.00                                                                                | 0.90                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.99                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1576                                                                              | 1564                                                                              |                                                                                   | 1553                                                                              | 1615                                                                              |                                                                                   |                                                                                   | 1637                                                                                |                                                                                     | 1545                                                                                | 1480                                                                                |                                                                                     |
| Flt Permitted                     | 0.51                                                                              | 1.00                                                                              |                                                                                   | 0.46                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.74                                                                                |                                                                                     | 0.62                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 851                                                                               | 1564                                                                              |                                                                                   | 747                                                                               | 1615                                                                              |                                                                                   |                                                                                   | 1222                                                                                |                                                                                     | 1008                                                                                | 1480                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                |
| Adj. Flow (vph)                   | 262                                                                               | 315                                                                               | 138                                                                               | 22                                                                                | 300                                                                               | 73                                                                                | 18                                                                                | 110                                                                                 | 12                                                                                  | 15                                                                                  | 122                                                                                 | 223                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 6                                                                                 | 0                                                                                 | 0                                                                                 | 5                                                                                   | 0                                                                                   | 0                                                                                   | 93                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 262                                                                               | 441                                                                               | 0                                                                                 | 22                                                                                | 367                                                                               | 0                                                                                 | 0                                                                                 | 135                                                                                 | 0                                                                                   | 15                                                                                  | 252                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 9                                                                                 |                                                                                   | 23                                                                                | 23                                                                                |                                                                                   | 9                                                                                 | 7                                                                                 |                                                                                     | 19                                                                                  | 19                                                                                  |                                                                                     | 7                                                                                   |
| Turn Type                         | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 59.5                                                                              | 59.5                                                                              |                                                                                   | 59.5                                                                              | 59.5                                                                              |                                                                                   |                                                                                   | 20.5                                                                                |                                                                                     | 20.5                                                                                | 20.5                                                                                |                                                                                     |
| Effective Green, g (s)            | 59.5                                                                              | 59.5                                                                              |                                                                                   | 59.5                                                                              | 59.5                                                                              |                                                                                   |                                                                                   | 20.5                                                                                |                                                                                     | 20.5                                                                                | 20.5                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.66                                                                              | 0.66                                                                              |                                                                                   | 0.66                                                                              | 0.66                                                                              |                                                                                   |                                                                                   | 0.23                                                                                |                                                                                     | 0.23                                                                                | 0.23                                                                                |                                                                                     |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |                                                                                   | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 562                                                                               | 1033                                                                              |                                                                                   | 493                                                                               | 1067                                                                              |                                                                                   |                                                                                   | 278                                                                                 |                                                                                     | 229                                                                                 | 337                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | 0.28                                                                              |                                                                                   |                                                                                   | 0.23                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     | c0.17                                                                               |                                                                                     |
| v/s Ratio Perm                    | c0.31                                                                             |                                                                                   |                                                                                   | 0.03                                                                              |                                                                                   |                                                                                   |                                                                                   | 0.11                                                                                |                                                                                     | 0.01                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.47                                                                              | 0.43                                                                              |                                                                                   | 0.04                                                                              | 0.34                                                                              |                                                                                   |                                                                                   | 0.49                                                                                |                                                                                     | 0.07                                                                                | 0.75                                                                                |                                                                                     |
| Uniform Delay, d1                 | 7.5                                                                               | 7.2                                                                               |                                                                                   | 5.3                                                                               | 6.7                                                                               |                                                                                   |                                                                                   | 30.2                                                                                |                                                                                     | 27.2                                                                                | 32.4                                                                                |                                                                                     |
| Progression Factor                | 0.90                                                                              | 0.88                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 0.91                                                                                | 0.86                                                                                |                                                                                     |
| Incremental Delay, d2             | 2.1                                                                               | 1.0                                                                               |                                                                                   | 0.2                                                                               | 0.9                                                                               |                                                                                   |                                                                                   | 1.3                                                                                 |                                                                                     | 0.1                                                                                 | 8.7                                                                                 |                                                                                     |
| Delay (s)                         | 8.9                                                                               | 7.3                                                                               |                                                                                   | 5.5                                                                               | 7.6                                                                               |                                                                                   |                                                                                   | 31.5                                                                                |                                                                                     | 25.0                                                                                | 36.4                                                                                |                                                                                     |
| Level of Service                  | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     | C                                                                                   | D                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 7.9                                                                               |                                                                                   |                                                                                   | 7.5                                                                               |                                                                                   |                                                                                   | 31.5                                                                                |                                                                                     |                                                                                     | 35.9                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 16.1                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.54                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                     |                                                                                     | 10.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 70.3%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 6: Maryland Ave &amp; Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |  |                                                                                   |  |                                                                                    |  |  |  |  |                                                                                     |
| Traffic Volume (vph)              | 12                                                                                | 4                                                                                 | 2                                                                                 | 302                                                                               | 0                                                                                 | 80                                                                                | 0                                                                                  | 332                                                                                 | 415                                                                                 | 21                                                                                  | 308                                                                                 | 0                                                                                   |
| Future Volume (vph)               | 12                                                                                | 4                                                                                 | 2                                                                                 | 302                                                                               | 0                                                                                 | 80                                                                                | 0                                                                                  | 332                                                                                 | 415                                                                                 | 21                                                                                  | 308                                                                                 | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                    | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 0.99                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.97                                                                              |                                                                                    | 1.00                                                                                | 0.96                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.98                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.85                                                                              |                                                                                    | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 1579                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1376                                                                              |                                                                                    | 1676                                                                                | 1363                                                                                | 1593                                                                                | 1676                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 0.18                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 1579                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1376                                                                              |                                                                                    | 1676                                                                                | 1363                                                                                | 301                                                                                 | 1676                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                               | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                |
| Adj. Flow (vph)                   | 17                                                                                | 6                                                                                 | 3                                                                                 | 425                                                                               | 0                                                                                 | 113                                                                               | 0                                                                                  | 468                                                                                 | 585                                                                                 | 30                                                                                  | 434                                                                                 | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 3                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                  | 0                                                                                   | 469                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 23                                                                                | 0                                                                                 | 425                                                                               | 0                                                                                 | 36                                                                                | 0                                                                                  | 468                                                                                 | 116                                                                                 | 30                                                                                  | 434                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 5                                                                                 |                                                                                   | 5                                                                                 | 5                                                                                 |                                                                                   | 5                                                                                 | 5                                                                                  |                                                                                     | 8                                                                                   | 8                                                                                   |                                                                                     | 5                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                |                                                                                   | Prot                                                                              |                                                                                   | Perm                                                                              |                                                                                    | NA                                                                                  | Perm                                                                                | pm+pt                                                                               | NA                                                                                  |                                                                                     |
| Protected Phases                  | 3                                                                                 | 3                                                                                 |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   |                                                                                    | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 4                                                                                 |                                                                                    |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 2.6                                                                               |                                                                                   | 28.8                                                                              |                                                                                   | 28.8                                                                              |                                                                                    | 17.8                                                                                | 17.8                                                                                | 45.1                                                                                | 45.1                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 2.6                                                                               |                                                                                   | 28.8                                                                              |                                                                                   | 28.8                                                                              |                                                                                    | 17.8                                                                                | 17.8                                                                                | 45.1                                                                                | 45.1                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.03                                                                              |                                                                                   | 0.32                                                                              |                                                                                   | 0.32                                                                              |                                                                                    | 0.20                                                                                | 0.20                                                                                | 0.50                                                                                | 0.50                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                    | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 4.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                    | 5.0                                                                                 | 5.0                                                                                 | 3.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 45                                                                                |                                                                                   | 509                                                                               |                                                                                   | 440                                                                               |                                                                                    | 331                                                                                 | 269                                                                                 | 478                                                                                 | 839                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.01                                                                             |                                                                                   | c0.27                                                                             |                                                                                   |                                                                                   |                                                                                    | c0.28                                                                               |                                                                                     | 0.02                                                                                | c0.26                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.03                                                                              |                                                                                    |                                                                                     | 0.08                                                                                | 0.02                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.51                                                                              |                                                                                   | 0.83                                                                              |                                                                                   | 0.08                                                                              |                                                                                    | 1.41                                                                                | 0.43                                                                                | 0.06                                                                                | 0.52                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 43.1                                                                              |                                                                                   | 28.4                                                                              |                                                                                   | 21.4                                                                              |                                                                                    | 36.1                                                                                | 31.7                                                                                | 13.3                                                                                | 15.1                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   | 1.16                                                                              |                                                                                   | 3.23                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 12.5                                                                              |                                                                                   | 10.1                                                                              |                                                                                   | 0.0                                                                               |                                                                                    | 203.3                                                                               | 5.0                                                                                 | 0.3                                                                                 | 2.3                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 55.6                                                                              |                                                                                   | 43.0                                                                              |                                                                                   | 69.2                                                                              |                                                                                    | 239.4                                                                               | 36.6                                                                                | 13.6                                                                                | 17.4                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 |                                                                                   | E                                                                                 |                                                                                    | F                                                                                   | D                                                                                   | B                                                                                   | B                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 55.6                                                                              |                                                                                   |                                                                                   | 48.5                                                                              |                                                                                   |                                                                                    | 126.7                                                                               |                                                                                     |                                                                                     | 17.1                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | F                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 81.2                                                                              |                                                                                   |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                          |                                                                                     |                                                                                     | F                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.88                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                               |                                                                                     |                                                                                     | 18.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 51.8%                                                                             |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                               |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
7: MD 355 & E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |  |  |  |                                                                                     |  |  |  |
| Traffic Volume (vph)              | 0                                                                                 | 591                                                                               | 238                                                                               | 0                                                                                 | 443                                                                               | 378                                                                               | 267                                                                                | 1003                                                                                | 0                                                                                   | 535                                                                                 | 847                                                                                 | 61                                                                                  |
| Future Volume (vph)               | 0                                                                                 | 591                                                                               | 238                                                                               | 0                                                                                 | 443                                                                               | 378                                                                               | 267                                                                                | 1003                                                                                | 0                                                                                   | 535                                                                                 | 847                                                                                 | 61                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              | 1.00                                                                              | 0.97                                                                               | 0.91                                                                                |                                                                                     | 0.97                                                                                | 0.91                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.96                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.99                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 3048                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4523                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 3048                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4523                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                               | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 603                                                                               | 243                                                                               | 0                                                                                 | 452                                                                               | 386                                                                               | 272                                                                                | 1023                                                                                | 0                                                                                   | 546                                                                                 | 864                                                                                 | 62                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 24                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 244                                                                               | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 4                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 822                                                                               | 0                                                                                 | 0                                                                                 | 452                                                                               | 142                                                                               | 272                                                                                | 1023                                                                                | 0                                                                                   | 546                                                                                 | 922                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 5                                                                                   |
| Turn Type                         |                                                                                   | NA                                                                                |                                                                                   |                                                                                   | NA                                                                                | Perm                                                                              | Prot                                                                               | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 1                                                                                  | 5                                                                                   |                                                                                     | 6                                                                                   | 2                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 51.0                                                                              |                                                                                   |                                                                                   | 51.0                                                                              | 51.0                                                                              | 25.0                                                                               | 76.0                                                                                |                                                                                     | 27.0                                                                                | 78.0                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 51.0                                                                              |                                                                                   |                                                                                   | 51.0                                                                              | 51.0                                                                              | 25.0                                                                               | 76.0                                                                                |                                                                                     | 27.0                                                                                | 78.0                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.28                                                                              |                                                                                   |                                                                                   | 0.28                                                                              | 0.28                                                                              | 0.14                                                                               | 0.42                                                                                |                                                                                     | 0.15                                                                                | 0.43                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 7.0                                                                                | 0.2                                                                                 |                                                                                     | 5.0                                                                                 | 0.2                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 863                                                                               |                                                                                   |                                                                                   | 902                                                                               | 403                                                                               | 429                                                                                | 1932                                                                                |                                                                                     | 463                                                                                 | 1959                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.27                                                                             |                                                                                   |                                                                                   | 0.14                                                                              |                                                                                   | 0.09                                                                               | c0.22                                                                               |                                                                                     | c0.18                                                                               | 0.20                                                                                |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.10                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.50                                                                              | 0.35                                                                              | 0.63                                                                               | 0.53                                                                                |                                                                                     | 1.18                                                                                | 0.47                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 63.3                                                                              |                                                                                   |                                                                                   | 53.9                                                                              | 51.4                                                                              | 73.2                                                                               | 38.7                                                                                |                                                                                     | 76.5                                                                                | 36.3                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 0.94                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 18.5                                                                              |                                                                                   |                                                                                   | 2.0                                                                               | 2.4                                                                               | 5.9                                                                                | 1.0                                                                                 |                                                                                     | 101.1                                                                               | 0.8                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 78.0                                                                              |                                                                                   |                                                                                   | 55.9                                                                              | 53.8                                                                              | 79.0                                                                               | 39.7                                                                                |                                                                                     | 177.6                                                                               | 37.1                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | D                                                                                 | E                                                                                  | D                                                                                   |                                                                                     | F                                                                                   | D                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 78.0                                                                              |                                                                                   |                                                                                   | 54.9                                                                              |                                                                                   |                                                                                    | 48.0                                                                                |                                                                                     |                                                                                     | 89.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | F                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 68.6                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | E                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.78                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 180.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 86.8%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | E                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 1: Monroe St &amp; E Middle Ln

| Movement              | EB  | EB  | WB  | WB  | NB |
|-----------------------|-----|-----|-----|-----|----|
| Directions Served     | T   | TR  | T   | T   | R  |
| Maximum Queue (ft)    | 33  | 19  | 35  | 12  | 57 |
| Average Queue (ft)    | 2   | 1   | 3   | 1   | 24 |
| 95th Queue (ft)       | 16  | 9   | 17  | 8   | 48 |
| Link Distance (ft)    | 640 | 640 | 187 | 187 |    |
| Upstream Blk Time (%) |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |
| Storage Bay Dist (ft) |     |     |     |     |    |
| Storage Blk Time (%)  |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |

## Intersection: 2: Monroe St &amp; E Montgomery Ave

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Intersection: 3: Monroe St &amp; Monroe Pl

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |



## ATTACHMENT A

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 4: Monroe St &amp; E Jefferson St

| Movement              | EB  | EB  | EB  | WB  | WB  | WB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | T   | TR  | L   | T   | TR  | L   | TR  | L   | TR  |
| Maximum Queue (ft)    | 66  | 194 | 231 | 149 | 391 | 495 | 112 | 190 | 56  | 165 |
| Average Queue (ft)    | 30  | 83  | 115 | 70  | 157 | 185 | 47  | 100 | 16  | 69  |
| 95th Queue (ft)       | 63  | 149 | 192 | 152 | 337 | 384 | 87  | 171 | 46  | 130 |
| Link Distance (ft)    |     | 546 | 546 |     | 886 | 886 |     | 433 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     | 0   |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     | 0   |     |     |     |     |
| Storage Bay Dist (ft) | 250 |     |     | 125 |     |     | 225 |     | 150 |     |
| Storage Blk Time (%)  |     |     |     | 0   | 9   |     |     | 0   |     | 1   |
| Queuing Penalty (veh) |     |     |     | 1   | 9   |     |     | 0   |     | 0   |

## Intersection: 5: Monroe St &amp; Fleet St

| Movement              | EB  | EB  | WB  | WB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | TR  | L   | TR  | LTR | L   | TR  |
| Maximum Queue (ft)    | 125 | 206 | 33  | 191 | 151 | 85  | 156 |
| Average Queue (ft)    | 61  | 93  | 7   | 81  | 75  | 30  | 56  |
| 95th Queue (ft)       | 116 | 174 | 27  | 149 | 128 | 68  | 109 |
| Link Distance (ft)    |     | 361 | 580 | 580 | 528 |     | 433 |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |     |     | 175 |     |
| Storage Blk Time (%)  | 2   | 5   |     |     |     |     | 0   |
| Queuing Penalty (veh) | 9   | 7   |     |     |     |     | 0   |

## Intersection: 6: Maryland Ave &amp; Fleet St

| Movement              | EB  | WB  | WB  | NB  | NB  | SB | SB  |
|-----------------------|-----|-----|-----|-----|-----|----|-----|
| Directions Served     | LTR | L   | R   | T   | R   | L  | T   |
| Maximum Queue (ft)    | 29  | 249 | 280 | 215 | 122 | 87 | 145 |
| Average Queue (ft)    | 3   | 162 | 54  | 111 | 24  | 29 | 50  |
| 95th Queue (ft)       | 18  | 256 | 164 | 192 | 74  | 64 | 107 |
| Link Distance (ft)    | 141 |     | 361 | 646 |     |    | 432 |
| Upstream Blk Time (%) |     |     | 0   |     |     |    |     |
| Queuing Penalty (veh) |     |     | 1   |     |     |    |     |
| Storage Bay Dist (ft) |     | 225 |     | 450 | 125 |    |     |
| Storage Blk Time (%)  |     | 3   | 0   |     |     |    | 0   |
| Queuing Penalty (veh) |     | 3   | 0   |     |     |    | 0   |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | EB  | EB  | WB  | WB  | WB  | NB  | NB  | NB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | T   | TR  | T   | T   | R   | L   | L   | T   | T   | T   | L   | L   |
| Maximum Queue (ft)    | 218 | 284 | 393 | 370 | 61  | 132 | 176 | 263 | 221 | 161 | 224 | 257 |
| Average Queue (ft)    | 108 | 120 | 261 | 231 | 4   | 45  | 90  | 150 | 135 | 73  | 100 | 156 |
| 95th Queue (ft)       | 179 | 232 | 367 | 342 | 27  | 124 | 158 | 219 | 196 | 163 | 213 | 236 |
| Link Distance (ft)    | 886 | 886 | 941 | 941 | 941 |     |     | 760 | 760 | 760 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     | 275 | 275 |     |     |     | 425 | 425 |
| Storage Blk Time (%)  |     |     |     |     |     |     |     | 0   |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     | 0   |     |     |     |     |

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | T   | T   | TR  |
| Maximum Queue (ft)    | 352 | 328 | 289 |
| Average Queue (ft)    | 248 | 233 | 172 |
| 95th Queue (ft)       | 339 | 312 | 263 |
| Link Distance (ft)    | 658 | 658 | 658 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Network Summary

Network wide Queuing Penalty: 30

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 1: Monroe St &amp; E Middle Ln

| Movement              | EB  | EB  | WB  | WB  | NB |
|-----------------------|-----|-----|-----|-----|----|
| Directions Served     | T   | TR  | T   | T   | R  |
| Maximum Queue (ft)    | 40  | 23  | 62  | 18  | 49 |
| Average Queue (ft)    | 5   | 1   | 7   | 1   | 28 |
| 95th Queue (ft)       | 24  | 12  | 34  | 11  | 50 |
| Link Distance (ft)    | 640 | 640 | 187 | 187 |    |
| Upstream Blk Time (%) |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |
| Storage Bay Dist (ft) |     |     |     |     |    |
| Storage Blk Time (%)  |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |

## Intersection: 2: Monroe St &amp; E Montgomery Ave

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Intersection: 3: Monroe St &amp; Monroe Pl

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 4: Monroe St &amp; E Jefferson St

| Movement              | EB  | EB  | EB  | WB  | WB  | WB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | T   | TR  | L   | T   | TR  | L   | TR  | L   | TR  |
| Maximum Queue (ft)    | 57  | 230 | 237 | 149 | 344 | 349 | 250 | 326 | 171 | 237 |
| Average Queue (ft)    | 27  | 138 | 127 | 58  | 203 | 228 | 66  | 180 | 56  | 109 |
| 95th Queue (ft)       | 55  | 211 | 206 | 150 | 328 | 327 | 170 | 297 | 131 | 195 |
| Link Distance (ft)    |     | 546 | 546 |     | 886 | 886 |     | 433 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 250 |     |     | 125 |     |     | 225 |     | 150 |     |
| Storage Blk Time (%)  |     | 0   |     | 0   | 13  |     |     | 9   | 0   | 5   |
| Queuing Penalty (veh) |     | 0   |     | 0   | 7   |     |     | 6   | 1   | 3   |

## Intersection: 5: Monroe St &amp; Fleet St

| Movement              | EB  | EB  | WB  | WB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | TR  | L   | TR  | LTR | L   | TR  |
| Maximum Queue (ft)    | 120 | 163 | 33  | 120 | 114 | 29  | 198 |
| Average Queue (ft)    | 54  | 59  | 5   | 46  | 50  | 6   | 93  |
| 95th Queue (ft)       | 100 | 119 | 24  | 100 | 97  | 24  | 170 |
| Link Distance (ft)    |     | 361 | 580 | 580 | 528 |     | 433 |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |     |     | 175 |     |
| Storage Blk Time (%)  | 1   | 1   |     |     |     |     | 1   |
| Queuing Penalty (veh) | 4   | 2   |     |     |     |     | 0   |

## Intersection: 6: Maryland Ave &amp; Fleet St

| Movement              | EB  | WB  | WB  | NB  | NB  | SB | SB  |
|-----------------------|-----|-----|-----|-----|-----|----|-----|
| Directions Served     | LTR | L   | R   | T   | R   | L  | T   |
| Maximum Queue (ft)    | 54  | 245 | 206 | 359 | 50  | 50 | 166 |
| Average Queue (ft)    | 13  | 173 | 42  | 183 | 5   | 11 | 67  |
| 95th Queue (ft)       | 37  | 253 | 122 | 306 | 26  | 35 | 135 |
| Link Distance (ft)    | 141 |     | 361 | 646 |     |    | 432 |
| Upstream Blk Time (%) |     |     |     |     |     |    |     |
| Queuing Penalty (veh) |     |     |     |     |     |    |     |
| Storage Bay Dist (ft) |     | 225 |     | 450 | 125 |    |     |
| Storage Blk Time (%)  |     | 3   |     | 0   |     |    | 1   |
| Queuing Penalty (veh) |     | 3   |     | 0   |     |    | 0   |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | EB  | EB  | WB  | WB  | WB  | NB  | NB  | NB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | T   | TR  | T   | T   | R   | L   | L   | T   | T   | T   | L   | L   |
| Maximum Queue (ft)    | 453 | 498 | 268 | 238 | 114 | 188 | 300 | 396 | 369 | 295 | 437 | 450 |
| Average Queue (ft)    | 286 | 330 | 163 | 135 | 15  | 86  | 157 | 250 | 223 | 172 | 434 | 448 |
| 95th Queue (ft)       | 430 | 469 | 248 | 224 | 62  | 185 | 278 | 362 | 321 | 272 | 451 | 454 |
| Link Distance (ft)    | 886 | 886 | 941 | 941 | 941 |     |     | 760 | 760 | 760 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     | 275 | 275 |     |     |     | 425 | 425 |
| Storage Blk Time (%)  |     |     |     |     |     | 0   | 4   |     |     |     | 11  | 73  |
| Queuing Penalty (veh) |     |     |     |     |     | 0   | 10  |     |     |     | 31  | 205 |

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | T   | T   | TR  |
| Maximum Queue (ft)    | 701 | 655 | 458 |
| Average Queue (ft)    | 665 | 444 | 267 |
| 95th Queue (ft)       | 768 | 719 | 410 |
| Link Distance (ft)    | 658 | 658 | 658 |
| Upstream Blk Time (%) | 71  | 0   |     |
| Queuing Penalty (veh) | 0   | 0   |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  | 2   |     |     |
| Queuing Penalty (veh) | 9   |     |     |

## Network Summary

Network wide Queuing Penalty: 281

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
1: Monroe St & E Middle Ln

04/14/2023

|                                   |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                |                                                                                   | ↑                                                                                 |
| Traffic Volume (veh/h)            | 229                                                                               | 14                                                                                | 0                                                                                 | 350                                                                               | 0                                                                                 | 42                                                                                |
| Future Volume (Veh/h)             | 229                                                                               | 14                                                                                | 0                                                                                 | 350                                                                               | 0                                                                                 | 42                                                                                |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              |
| Hourly flow rate (vph)            | 266                                                                               | 16                                                                                | 0                                                                                 | 407                                                                               | 0                                                                                 | 49                                                                                |
| Pedestrians                       | 11                                                                                |                                                                                   |                                                                                   | 1                                                                                 | 29                                                                                |                                                                                   |
| Lane Width (ft)                   | 12.0                                                                              |                                                                                   |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   |
| Walking Speed (ft/s)              | 3.5                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   |
| Percent Blockage                  | 1                                                                                 |                                                                                   |                                                                                   | 0                                                                                 | 3                                                                                 |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   | 311                                                                               |                                                                                   | 518                                                                               | 171                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 311                                                                               |                                                                                   | 518                                                                               | 171                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   | 6.8                                                                               | 6.9                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   | 100                                                                               |                                                                                   | 100                                                                               | 94                                                                                |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 1212                                                                              |                                                                                   | 469                                                                               | 819                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1                                                                              | WB 2                                                                              | NB 1                                                                              |                                                                                   |
| Volume Total                      | 177                                                                               | 105                                                                               | 204                                                                               | 204                                                                               | 49                                                                                |                                                                                   |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |
| Volume Right                      | 0                                                                                 | 16                                                                                | 0                                                                                 | 0                                                                                 | 49                                                                                |                                                                                   |
| cSH                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 819                                                                               |                                                                                   |
| Volume to Capacity                | 0.10                                                                              | 0.06                                                                              | 0.12                                                                              | 0.12                                                                              | 0.06                                                                              |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 5                                                                                 |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 9.7                                                                               |                                                                                   |
| Lane LOS                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 9.7                                                                               |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.6                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 21.5%                                                                             |                                                                                   | ICU Level of Service                                                              | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

ATTACHMENT A

# HCM Unsignalized Intersection Capacity Analysis 2: Monroe St & E Montgomery Ave

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              | Stop                                                                              |                                                                                   |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 3.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 917                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              | A                                                                                 |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
3: Monroe St & Monroe PI

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                    |  |  |                                                                                     |  |                                                                                     |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                    | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 4.5                                                                               | 4.5                                                                               | 4.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 806                                                                               | 806                                                                               | 900                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.3                                                                               | 6.3                                                                               | 7.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 4: Monroe St &amp; E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 69                                                                                | 568                                                                               | 64                                                                                | 96                                                                                | 674                                                                               | 56                                                                                | 70                                                                                 | 135                                                                                 | 71                                                                                  | 15                                                                                  | 78                                                                                  | 41                                                                                  |
| Future Volume (vph)               | 69                                                                                | 568                                                                               | 64                                                                                | 96                                                                                | 674                                                                               | 56                                                                                | 70                                                                                 | 135                                                                                 | 71                                                                                  | 15                                                                                  | 78                                                                                  | 41                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   | 6.0                                                                                | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 0.96                                                                                |                                                                                     | 1.00                                                                                | 0.96                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.90                                                                               | 1.00                                                                                |                                                                                     | 0.93                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                               | 0.95                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1592                                                                              | 3123                                                                              |                                                                                   | 1589                                                                              | 3140                                                                              |                                                                                   | 1437                                                                               | 1527                                                                                |                                                                                     | 1488                                                                                | 1520                                                                                |                                                                                     |
| Flt Permitted                     | 0.23                                                                              | 1.00                                                                              |                                                                                   | 0.29                                                                              | 1.00                                                                              |                                                                                   | 0.68                                                                               | 1.00                                                                                |                                                                                     | 0.44                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 391                                                                               | 3123                                                                              |                                                                                   | 490                                                                               | 3140                                                                              |                                                                                   | 1022                                                                               | 1527                                                                                |                                                                                     | 693                                                                                 | 1520                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                               | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                |
| Adj. Flow (vph)                   | 73                                                                                | 604                                                                               | 68                                                                                | 102                                                                               | 717                                                                               | 60                                                                                | 74                                                                                 | 144                                                                                 | 76                                                                                  | 16                                                                                  | 83                                                                                  | 44                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 73                                                                                | 672                                                                               | 0                                                                                 | 102                                                                               | 777                                                                               | 0                                                                                 | 74                                                                                 | 220                                                                                 | 0                                                                                   | 16                                                                                  | 127                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 8                                                                                 |                                                                                   | 16                                                                                | 16                                                                                |                                                                                   | 8                                                                                 | 66                                                                                 |                                                                                     | 59                                                                                  | 59                                                                                  |                                                                                     | 66                                                                                  |
| Turn Type                         | pm+pt                                                                             | NA                                                                                |                                                                                   | pm+pt                                                                             | NA                                                                                |                                                                                   | Perm                                                                               | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  | 1                                                                                 | 6                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                 |                                                                                   |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                  |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 36.7                                                                              | 32.7                                                                              |                                                                                   | 36.7                                                                              | 32.7                                                                              |                                                                                   | 15.3                                                                               | 15.3                                                                                |                                                                                     | 15.3                                                                                | 15.3                                                                                |                                                                                     |
| Effective Green, g (s)            | 36.7                                                                              | 32.7                                                                              |                                                                                   | 36.7                                                                              | 32.7                                                                              |                                                                                   | 15.3                                                                               | 15.3                                                                                |                                                                                     | 15.3                                                                                | 15.3                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.41                                                                              | 0.36                                                                              |                                                                                   | 0.41                                                                              | 0.36                                                                              |                                                                                   | 0.17                                                                               | 0.17                                                                                |                                                                                     | 0.17                                                                                | 0.17                                                                                |                                                                                     |
| Clearance Time (s)                | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   | 6.0                                                                                | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 212                                                                               | 1134                                                                              |                                                                                   | 248                                                                               | 1140                                                                              |                                                                                   | 173                                                                                | 259                                                                                 |                                                                                     | 117                                                                                 | 258                                                                                 |                                                                                     |
| v/s Ratio Prot                    | 0.02                                                                              | 0.22                                                                              |                                                                                   | c0.02                                                                             | c0.25                                                                             |                                                                                   |                                                                                    | c0.14                                                                               |                                                                                     |                                                                                     | 0.08                                                                                |                                                                                     |
| v/s Ratio Perm                    | 0.12                                                                              |                                                                                   |                                                                                   | 0.15                                                                              |                                                                                   |                                                                                   | 0.07                                                                               |                                                                                     |                                                                                     | 0.02                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.34                                                                              | 0.59                                                                              |                                                                                   | 0.41                                                                              | 0.68                                                                              |                                                                                   | 0.43                                                                               | 0.85                                                                                |                                                                                     | 0.14                                                                                | 0.49                                                                                |                                                                                     |
| Uniform Delay, d1                 | 17.4                                                                              | 23.2                                                                              |                                                                                   | 17.3                                                                              | 24.2                                                                              |                                                                                   | 33.4                                                                               | 36.2                                                                                |                                                                                     | 31.7                                                                                | 33.8                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.85                                                                               | 0.88                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 1.0                                                                               | 2.3                                                                               |                                                                                   | 1.1                                                                               | 3.3                                                                               |                                                                                   | 1.5                                                                                | 19.8                                                                                |                                                                                     | 0.5                                                                                 | 1.5                                                                                 |                                                                                     |
| Delay (s)                         | 18.3                                                                              | 25.5                                                                              |                                                                                   | 18.5                                                                              | 27.5                                                                              |                                                                                   | 30.0                                                                               | 51.8                                                                                |                                                                                     | 32.3                                                                                | 35.3                                                                                |                                                                                     |
| Level of Service                  | B                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | C                                                                                  | D                                                                                   |                                                                                     | C                                                                                   | D                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 24.8                                                                              |                                                                                   |                                                                                   | 26.5                                                                              |                                                                                   |                                                                                    | 46.3                                                                                |                                                                                     |                                                                                     | 35.0                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 29.3                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.52                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 19.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 59.3%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
5: Monroe St & Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |                                                                                   |    |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 148                                                                               | 314                                                                               | 62                                                                                | 10                                                                                | 275                                                                               | 81                                                                                | 43                                                                                | 69                                                                                  | 21                                                                                  | 43                                                                                  | 43                                                                                  | 83                                                                                  |
| Future Volume (vph)               | 148                                                                               | 314                                                                               | 62                                                                                | 10                                                                                | 275                                                                               | 81                                                                                | 43                                                                                | 69                                                                                  | 21                                                                                  | 43                                                                                  | 43                                                                                  | 83                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.93                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.98                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.97                                                                              |                                                                                   |                                                                                   | 0.98                                                                                |                                                                                     | 1.00                                                                                | 0.90                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.98                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1567                                                                              | 1618                                                                              |                                                                                   | 1567                                                                              | 1597                                                                              |                                                                                   |                                                                                   | 1576                                                                                |                                                                                     | 1582                                                                                | 1407                                                                                |                                                                                     |
| Flt Permitted                     | 0.41                                                                              | 1.00                                                                              |                                                                                   | 0.39                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.69                                                                                |                                                                                     | 0.52                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 676                                                                               | 1618                                                                              |                                                                                   | 646                                                                               | 1597                                                                              |                                                                                   |                                                                                   | 1112                                                                                |                                                                                     | 873                                                                                 | 1407                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                |
| Adj. Flow (vph)                   | 224                                                                               | 476                                                                               | 94                                                                                | 15                                                                                | 417                                                                               | 123                                                                               | 65                                                                                | 105                                                                                 | 32                                                                                  | 65                                                                                  | 65                                                                                  | 126                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 6                                                                                 | 0                                                                                 | 0                                                                                 | 8                                                                                 | 0                                                                                 | 0                                                                                 | 9                                                                                   | 0                                                                                   | 0                                                                                   | 91                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 224                                                                               | 564                                                                               | 0                                                                                 | 15                                                                                | 532                                                                               | 0                                                                                 | 0                                                                                 | 193                                                                                 | 0                                                                                   | 65                                                                                  | 100                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 20                                                                                |                                                                                   | 19                                                                                | 19                                                                                |                                                                                   | 20                                                                                | 40                                                                                |                                                                                     | 5                                                                                   | 5                                                                                   |                                                                                     | 40                                                                                  |
| Turn Type                         | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 61.9                                                                              | 61.9                                                                              |                                                                                   | 61.9                                                                              | 61.9                                                                              |                                                                                   |                                                                                   | 18.1                                                                                |                                                                                     | 18.1                                                                                | 18.1                                                                                |                                                                                     |
| Effective Green, g (s)            | 61.9                                                                              | 61.9                                                                              |                                                                                   | 61.9                                                                              | 61.9                                                                              |                                                                                   |                                                                                   | 18.1                                                                                |                                                                                     | 18.1                                                                                | 18.1                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.69                                                                              | 0.69                                                                              |                                                                                   | 0.69                                                                              | 0.69                                                                              |                                                                                   |                                                                                   | 0.20                                                                                |                                                                                     | 0.20                                                                                | 0.20                                                                                |                                                                                     |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |                                                                                   | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 464                                                                               | 1112                                                                              |                                                                                   | 444                                                                               | 1098                                                                              |                                                                                   |                                                                                   | 223                                                                                 |                                                                                     | 175                                                                                 | 282                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.35                                                                             |                                                                                   |                                                                                   | 0.33                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     | 0.07                                                                                |                                                                                     |
| v/s Ratio Perm                    | 0.33                                                                              |                                                                                   |                                                                                   | 0.02                                                                              |                                                                                   |                                                                                   |                                                                                   | c0.17                                                                               |                                                                                     | 0.07                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.48                                                                              | 0.51                                                                              |                                                                                   | 0.03                                                                              | 0.48                                                                              |                                                                                   |                                                                                   | 0.87                                                                                |                                                                                     | 0.37                                                                                | 0.35                                                                                |                                                                                     |
| Uniform Delay, d1                 | 6.6                                                                               | 6.7                                                                               |                                                                                   | 4.5                                                                               | 6.6                                                                               |                                                                                   |                                                                                   | 34.8                                                                                |                                                                                     | 31.0                                                                                | 30.9                                                                                |                                                                                     |
| Progression Factor                | 0.85                                                                              | 0.84                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 0.87                                                                                | 0.80                                                                                |                                                                                     |
| Incremental Delay, d2             | 3.1                                                                               | 1.4                                                                               |                                                                                   | 0.1                                                                               | 1.5                                                                               |                                                                                   |                                                                                   | 27.8                                                                                |                                                                                     | 1.2                                                                                 | 0.7                                                                                 |                                                                                     |
| Delay (s)                         | 8.7                                                                               | 7.1                                                                               |                                                                                   | 4.6                                                                               | 8.1                                                                               |                                                                                   |                                                                                   | 62.6                                                                                |                                                                                     | 28.2                                                                                | 25.5                                                                                |                                                                                     |
| Level of Service                  | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   | E                                                                                   |                                                                                     | C                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 7.5                                                                               |                                                                                   |                                                                                   | 8.0                                                                               |                                                                                   |                                                                                   | 62.6                                                                                |                                                                                     |                                                                                     | 26.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | E                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 16.5                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.59                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                   | 10.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 85.6%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                   | E                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 6: Maryland Ave &amp; Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |  |                                                                                   |  |                                                                                   |  |  |  |  |                                                                                     |
| Traffic Volume (vph)              | 2                                                                                 | 1                                                                                 | 1                                                                                 | 315                                                                               | 0                                                                                 | 101                                                                               | 0                                                                                 | 276                                                                                 | 451                                                                                 | 87                                                                                  | 245                                                                                 | 0                                                                                   |
| Future Volume (vph)               | 2                                                                                 | 1                                                                                 | 1                                                                                 | 315                                                                               | 0                                                                                 | 101                                                                               | 0                                                                                 | 276                                                                                 | 451                                                                                 | 87                                                                                  | 245                                                                                 | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 0.98                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.97                                                                              |                                                                                   | 1.00                                                                                | 0.97                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.97                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.85                                                                              |                                                                                   | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 1545                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1384                                                                              |                                                                                   | 1676                                                                                | 1388                                                                                | 1593                                                                                | 1676                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.27                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 1545                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1384                                                                              |                                                                                   | 1676                                                                                | 1388                                                                                | 456                                                                                 | 1676                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                |
| Adj. Flow (vph)                   | 3                                                                                 | 1                                                                                 | 1                                                                                 | 399                                                                               | 0                                                                                 | 128                                                                               | 0                                                                                 | 349                                                                                 | 571                                                                                 | 110                                                                                 | 310                                                                                 | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 88                                                                                | 0                                                                                 | 0                                                                                   | 407                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 4                                                                                 | 0                                                                                 | 399                                                                               | 0                                                                                 | 40                                                                                | 0                                                                                 | 349                                                                                 | 164                                                                                 | 110                                                                                 | 310                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 3                                                                                 |                                                                                   | 3                                                                                 | 3                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 |                                                                                     | 2                                                                                   | 2                                                                                   |                                                                                     | 7                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                |                                                                                   | Prot                                                                              |                                                                                   | Perm                                                                              |                                                                                   | NA                                                                                  | Perm                                                                                | pm+pt                                                                               | NA                                                                                  |                                                                                     |
| Protected Phases                  | 3                                                                                 | 3                                                                                 |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   |                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 4                                                                                 |                                                                                   |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 1.3                                                                               |                                                                                   | 28.0                                                                              |                                                                                   | 28.0                                                                              |                                                                                   | 25.9                                                                                | 25.9                                                                                | 47.2                                                                                | 47.2                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 1.3                                                                               |                                                                                   | 28.0                                                                              |                                                                                   | 28.0                                                                              |                                                                                   | 25.9                                                                                | 25.9                                                                                | 47.2                                                                                | 47.2                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.01                                                                              |                                                                                   | 0.31                                                                              |                                                                                   | 0.31                                                                              |                                                                                   | 0.29                                                                                | 0.29                                                                                | 0.52                                                                                | 0.52                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 4.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 5.0                                                                                 | 5.0                                                                                 | 3.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 22                                                                                |                                                                                   | 495                                                                               |                                                                                   | 430                                                                               |                                                                                   | 482                                                                                 | 399                                                                                 | 451                                                                                 | 878                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.00                                                                             |                                                                                   | c0.25                                                                             |                                                                                   |                                                                                   |                                                                                   | c0.21                                                                               |                                                                                     | 0.05                                                                                | c0.18                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.03                                                                              |                                                                                   |                                                                                     | 0.12                                                                                | 0.08                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.18                                                                              |                                                                                   | 0.81                                                                              |                                                                                   | 0.09                                                                              |                                                                                   | 0.72                                                                                | 0.41                                                                                | 0.24                                                                                | 0.35                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 43.8                                                                              |                                                                                   | 28.5                                                                              |                                                                                   | 22.0                                                                              |                                                                                   | 28.8                                                                                | 25.9                                                                                | 12.4                                                                                | 12.5                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   | 1.06                                                                              |                                                                                   | 1.40                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 5.4                                                                               |                                                                                   | 8.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 9.1                                                                                 | 3.1                                                                                 | 1.3                                                                                 | 1.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 49.2                                                                              |                                                                                   | 38.3                                                                              |                                                                                   | 30.9                                                                              |                                                                                   | 38.0                                                                                | 29.0                                                                                | 13.7                                                                                | 13.6                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   | C                                                                                 |                                                                                   | D                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 49.2                                                                              |                                                                                   |                                                                                   | 36.5                                                                              |                                                                                   |                                                                                   | 32.4                                                                                |                                                                                     |                                                                                     | 13.6                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 29.4                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                     | 18.0                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 58.4%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
7: MD 355 & E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                | ↑                                                                                 | ↑↑                                                                                | ↑↑↑                                                                                 |                                                                                     | ↑↑                                                                                  | ↑↑↑                                                                                 |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 307                                                                               | 305                                                                               | 0                                                                                 | 683                                                                               | 387                                                                               | 170                                                                               | 525                                                                                 | 0                                                                                   | 325                                                                                 | 1208                                                                                | 49                                                                                  |
| Future Volume (vph)               | 0                                                                                 | 307                                                                               | 305                                                                               | 0                                                                                 | 683                                                                               | 387                                                                               | 170                                                                               | 525                                                                                 | 0                                                                                   | 325                                                                                 | 1208                                                                                | 49                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                               | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              | 1.00                                                                              | 0.97                                                                              | 0.91                                                                                |                                                                                     | 0.97                                                                                | 0.91                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.93                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.99                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 2947                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                              | 4577                                                                                |                                                                                     | 3090                                                                                | 4544                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 2947                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                              | 4577                                                                                |                                                                                     | 3090                                                                                | 4544                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 313                                                                               | 311                                                                               | 0                                                                                 | 697                                                                               | 395                                                                               | 173                                                                               | 536                                                                                 | 0                                                                                   | 332                                                                                 | 1233                                                                                | 50                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 120                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 284                                                                               | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 3                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 504                                                                               | 0                                                                                 | 0                                                                                 | 697                                                                               | 111                                                                               | 173                                                                               | 536                                                                                 | 0                                                                                   | 332                                                                                 | 1280                                                                                | 0                                                                                   |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 10                                                                                  |
| Turn Type                         |                                                                                   | NA                                                                                |                                                                                   |                                                                                   | NA                                                                                | Perm                                                                              | Prot                                                                              | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 1                                                                                 | 5                                                                                   |                                                                                     | 6                                                                                   | 2                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 38.0                                                                              |                                                                                   |                                                                                   | 38.0                                                                              | 38.0                                                                              | 13.0                                                                              | 45.0                                                                                |                                                                                     | 41.0                                                                                | 73.0                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 38.0                                                                              |                                                                                   |                                                                                   | 38.0                                                                              | 38.0                                                                              | 13.0                                                                              | 45.0                                                                                |                                                                                     | 41.0                                                                                | 73.0                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.25                                                                              |                                                                                   |                                                                                   | 0.25                                                                              | 0.25                                                                              | 0.09                                                                              | 0.30                                                                                |                                                                                     | 0.27                                                                                | 0.49                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                               | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 7.0                                                                               | 0.2                                                                                 |                                                                                     | 5.0                                                                                 | 0.2                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 746                                                                               |                                                                                   |                                                                                   | 806                                                                               | 361                                                                               | 267                                                                               | 1373                                                                                |                                                                                     | 844                                                                                 | 2211                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | 0.17                                                                              |                                                                                   |                                                                                   | c0.22                                                                             |                                                                                   | c0.06                                                                             | 0.12                                                                                |                                                                                     | 0.11                                                                                | c0.28                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.08                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.68                                                                              |                                                                                   |                                                                                   | 0.86                                                                              | 0.31                                                                              | 0.65                                                                              | 0.39                                                                                |                                                                                     | 0.39                                                                                | 0.58                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 50.4                                                                              |                                                                                   |                                                                                   | 53.5                                                                              | 45.3                                                                              | 66.3                                                                              | 41.6                                                                                |                                                                                     | 44.4                                                                                | 27.5                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 4.9                                                                               |                                                                                   |                                                                                   | 11.9                                                                              | 2.2                                                                               | 9.9                                                                               | 0.8                                                                                 |                                                                                     | 1.4                                                                                 | 1.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 55.3                                                                              |                                                                                   |                                                                                   | 65.5                                                                              | 47.5                                                                              | 76.2                                                                              | 42.5                                                                                |                                                                                     | 45.8                                                                                | 28.6                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | D                                                                                 | E                                                                                 | D                                                                                   |                                                                                     | D                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 55.3                                                                              |                                                                                   |                                                                                   | 59.0                                                                              |                                                                                   |                                                                                   | 50.7                                                                                |                                                                                     |                                                                                     | 32.1                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 46.2                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                   | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 150.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                   | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 75.2%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                   | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
1: Monroe St & E Middle Ln

04/14/2023

|                                   |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                |                                                                                   | ↑                                                                                 |
| Traffic Volume (veh/h)            | 435                                                                               | 4                                                                                 | 0                                                                                 | 322                                                                               | 0                                                                                 | 51                                                                                |
| Future Volume (Veh/h)             | 435                                                                               | 4                                                                                 | 0                                                                                 | 322                                                                               | 0                                                                                 | 51                                                                                |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              |
| Hourly flow rate (vph)            | 500                                                                               | 5                                                                                 | 0                                                                                 | 370                                                                               | 0                                                                                 | 59                                                                                |
| Pedestrians                       | 12                                                                                |                                                                                   |                                                                                   | 2                                                                                 | 38                                                                                |                                                                                   |
| Lane Width (ft)                   | 12.0                                                                              |                                                                                   |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   |
| Walking Speed (ft/s)              | 3.5                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   |
| Percent Blockage                  | 1                                                                                 |                                                                                   |                                                                                   | 0                                                                                 | 4                                                                                 |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   | 543                                                                               |                                                                                   | 738                                                                               | 292                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 543                                                                               |                                                                                   | 738                                                                               | 292                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   | 6.8                                                                               | 6.9                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   | 100                                                                               |                                                                                   | 100                                                                               | 91                                                                                |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 985                                                                               |                                                                                   | 337                                                                               | 677                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1                                                                              | WB 2                                                                              | NB 1                                                                              |                                                                                   |
| Volume Total                      | 333                                                                               | 172                                                                               | 185                                                                               | 185                                                                               | 59                                                                                |                                                                                   |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |
| Volume Right                      | 0                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                 | 59                                                                                |                                                                                   |
| cSH                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 677                                                                               |                                                                                   |
| Volume to Capacity                | 0.20                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.09                                                                              |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 7                                                                                 |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 10.8                                                                              |                                                                                   |
| Lane LOS                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 10.8                                                                              |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.7                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 24.5%                                                                             |                                                                                   | ICU Level of Service                                                              | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

ATTACHMENT A

# HCM Unsignalized Intersection Capacity Analysis 2: Monroe St & E Montgomery Ave

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              | Stop                                                                              |                                                                                   |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 3.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 917                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              | A                                                                                 |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

ATTACHMENT A

# HCM Unsignalized Intersection Capacity Analysis 3: Monroe St & Monroe PI

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
|                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |  |  |  |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                    |  |  |                                                                                     |  |                                                                                     |  |  |  |  |  |  |  |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                    | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |  |  |  |  |  |  |  |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 4.5                                                                               | 4.5                                                                               | 4.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 806                                                                               | 806                                                                               | 900                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.3                                                                               | 6.3                                                                               | 7.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 4: Monroe St &amp; E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 47                                                                                | 744                                                                               | 37                                                                                | 53                                                                                | 652                                                                               | 30                                                                                | 65                                                                                 | 106                                                                                 | 183                                                                                 | 62                                                                                  | 97                                                                                  | 96                                                                                  |
| Future Volume (vph)               | 47                                                                                | 744                                                                               | 37                                                                                | 53                                                                                | 652                                                                               | 30                                                                                | 65                                                                                 | 106                                                                                 | 183                                                                                 | 62                                                                                  | 97                                                                                  | 96                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   | 6.0                                                                                | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 0.94                                                                                |                                                                                     | 1.00                                                                                | 0.93                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.92                                                                               | 1.00                                                                                |                                                                                     | 0.96                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                               | 0.90                                                                                |                                                                                     | 1.00                                                                                | 0.93                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1591                                                                              | 3156                                                                              |                                                                                   | 1591                                                                              | 3159                                                                              |                                                                                   | 1462                                                                               | 1432                                                                                |                                                                                     | 1535                                                                                | 1450                                                                                |                                                                                     |
| Flt Permitted                     | 0.26                                                                              | 1.00                                                                              |                                                                                   | 0.18                                                                              | 1.00                                                                              |                                                                                   | 0.49                                                                               | 1.00                                                                                |                                                                                     | 0.25                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 428                                                                               | 3156                                                                              |                                                                                   | 296                                                                               | 3159                                                                              |                                                                                   | 761                                                                                | 1432                                                                                |                                                                                     | 410                                                                                 | 1450                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 51                                                                                | 809                                                                               | 40                                                                                | 58                                                                                | 709                                                                               | 33                                                                                | 71                                                                                 | 115                                                                                 | 199                                                                                 | 67                                                                                  | 105                                                                                 | 104                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 51                                                                                | 849                                                                               | 0                                                                                 | 58                                                                                | 742                                                                               | 0                                                                                 | 71                                                                                 | 314                                                                                 | 0                                                                                   | 67                                                                                  | 209                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 8                                                                                 |                                                                                   | 19                                                                                | 19                                                                                |                                                                                   | 8                                                                                 | 77                                                                                 |                                                                                     | 49                                                                                  | 49                                                                                  |                                                                                     | 77                                                                                  |
| Turn Type                         | pm+pt                                                                             | NA                                                                                |                                                                                   | pm+pt                                                                             | NA                                                                                |                                                                                   | Perm                                                                               | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  | 1                                                                                 | 6                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                 |                                                                                   |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                  |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 34.0                                                                              | 31.0                                                                              |                                                                                   | 36.0                                                                              | 32.0                                                                              |                                                                                   | 17.0                                                                               | 17.0                                                                                |                                                                                     | 17.0                                                                                | 17.0                                                                                |                                                                                     |
| Effective Green, g (s)            | 34.0                                                                              | 31.0                                                                              |                                                                                   | 36.0                                                                              | 32.0                                                                              |                                                                                   | 17.0                                                                               | 17.0                                                                                |                                                                                     | 17.0                                                                                | 17.0                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.38                                                                              | 0.34                                                                              |                                                                                   | 0.40                                                                              | 0.36                                                                              |                                                                                   | 0.19                                                                               | 0.19                                                                                |                                                                                     | 0.19                                                                                | 0.19                                                                                |                                                                                     |
| Clearance Time (s)                | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   | 6.0                                                                                | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 200                                                                               | 1087                                                                              |                                                                                   | 175                                                                               | 1123                                                                              |                                                                                   | 143                                                                                | 270                                                                                 |                                                                                     | 77                                                                                  | 273                                                                                 |                                                                                     |
| v/s Ratio Prot                    | 0.01                                                                              | c0.27                                                                             |                                                                                   | c0.01                                                                             | 0.23                                                                              |                                                                                   |                                                                                    | c0.22                                                                               |                                                                                     |                                                                                     | 0.14                                                                                |                                                                                     |
| v/s Ratio Perm                    | 0.09                                                                              |                                                                                   |                                                                                   | 0.12                                                                              |                                                                                   |                                                                                   | 0.09                                                                               |                                                                                     |                                                                                     | 0.16                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.26                                                                              | 0.78                                                                              |                                                                                   | 0.33                                                                              | 0.66                                                                              |                                                                                   | 0.50                                                                               | 1.16                                                                                |                                                                                     | 0.87                                                                                | 0.77                                                                                |                                                                                     |
| Uniform Delay, d1                 | 18.6                                                                              | 26.5                                                                              |                                                                                   | 18.2                                                                              | 24.4                                                                              |                                                                                   | 32.7                                                                               | 36.5                                                                                |                                                                                     | 35.4                                                                                | 34.6                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.16                                                                              | 1.63                                                                              |                                                                                   | 0.88                                                                               | 0.95                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 0.7                                                                               | 5.6                                                                               |                                                                                   | 1.0                                                                               | 2.8                                                                               |                                                                                   | 2.5                                                                                | 104.5                                                                               |                                                                                     | 60.8                                                                                | 12.1                                                                                |                                                                                     |
| Delay (s)                         | 19.2                                                                              | 32.0                                                                              |                                                                                   | 22.1                                                                              | 42.6                                                                              |                                                                                   | 31.3                                                                               | 139.2                                                                               |                                                                                     | 96.2                                                                                | 46.7                                                                                |                                                                                     |
| Level of Service                  | B                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   | C                                                                                  | F                                                                                   |                                                                                     | F                                                                                   | D                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 31.3                                                                              |                                                                                   |                                                                                   | 41.1                                                                              |                                                                                   |                                                                                    | 119.3                                                                               |                                                                                     |                                                                                     | 58.7                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | F                                                                                   |                                                                                     |                                                                                     | E                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 52.2                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.64                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 19.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 73.7%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
5: Monroe St & Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |                                                                                   |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 157                                                                               | 189                                                                               | 83                                                                                | 13                                                                                | 180                                                                               | 44                                                                                | 11                                                                                | 66                                                                                  | 7                                                                                   | 9                                                                                   | 73                                                                                  | 134                                                                                 |
| Future Volume (vph)               | 157                                                                               | 189                                                                               | 83                                                                                | 13                                                                                | 180                                                                               | 44                                                                                | 11                                                                                | 66                                                                                  | 7                                                                                   | 9                                                                                   | 73                                                                                  | 134                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   |                                                                                   | 0.99                                                                                |                                                                                     | 1.00                                                                                | 0.98                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.97                                                                              |                                                                                   |                                                                                   | 0.99                                                                                |                                                                                     | 1.00                                                                                | 0.90                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.99                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1576                                                                              | 1564                                                                              |                                                                                   | 1553                                                                              | 1615                                                                              |                                                                                   |                                                                                   | 1637                                                                                |                                                                                     | 1545                                                                                | 1480                                                                                |                                                                                     |
| Flt Permitted                     | 0.51                                                                              | 1.00                                                                              |                                                                                   | 0.46                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 0.74                                                                                |                                                                                     | 0.62                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 851                                                                               | 1564                                                                              |                                                                                   | 747                                                                               | 1615                                                                              |                                                                                   |                                                                                   | 1222                                                                                |                                                                                     | 1008                                                                                | 1480                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                |
| Adj. Flow (vph)                   | 262                                                                               | 315                                                                               | 138                                                                               | 22                                                                                | 300                                                                               | 73                                                                                | 18                                                                                | 110                                                                                 | 12                                                                                  | 15                                                                                  | 122                                                                                 | 223                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 6                                                                                 | 0                                                                                 | 0                                                                                 | 5                                                                                   | 0                                                                                   | 0                                                                                   | 93                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 262                                                                               | 441                                                                               | 0                                                                                 | 22                                                                                | 367                                                                               | 0                                                                                 | 0                                                                                 | 135                                                                                 | 0                                                                                   | 15                                                                                  | 252                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 9                                                                                 |                                                                                   | 23                                                                                | 23                                                                                |                                                                                   | 9                                                                                 | 7                                                                                 |                                                                                     | 19                                                                                  | 19                                                                                  |                                                                                     | 7                                                                                   |
| Turn Type                         | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 59.5                                                                              | 59.5                                                                              |                                                                                   | 59.5                                                                              | 59.5                                                                              |                                                                                   |                                                                                   | 20.5                                                                                |                                                                                     | 20.5                                                                                | 20.5                                                                                |                                                                                     |
| Effective Green, g (s)            | 59.5                                                                              | 59.5                                                                              |                                                                                   | 59.5                                                                              | 59.5                                                                              |                                                                                   |                                                                                   | 20.5                                                                                |                                                                                     | 20.5                                                                                | 20.5                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.66                                                                              | 0.66                                                                              |                                                                                   | 0.66                                                                              | 0.66                                                                              |                                                                                   |                                                                                   | 0.23                                                                                |                                                                                     | 0.23                                                                                | 0.23                                                                                |                                                                                     |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |                                                                                   | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 562                                                                               | 1033                                                                              |                                                                                   | 493                                                                               | 1067                                                                              |                                                                                   |                                                                                   | 278                                                                                 |                                                                                     | 229                                                                                 | 337                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | 0.28                                                                              |                                                                                   |                                                                                   | 0.23                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     | c0.17                                                                               |                                                                                     |
| v/s Ratio Perm                    | c0.31                                                                             |                                                                                   |                                                                                   | 0.03                                                                              |                                                                                   |                                                                                   |                                                                                   | 0.11                                                                                |                                                                                     | 0.01                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.47                                                                              | 0.43                                                                              |                                                                                   | 0.04                                                                              | 0.34                                                                              |                                                                                   |                                                                                   | 0.49                                                                                |                                                                                     | 0.07                                                                                | 0.75                                                                                |                                                                                     |
| Uniform Delay, d1                 | 7.5                                                                               | 7.2                                                                               |                                                                                   | 5.3                                                                               | 6.7                                                                               |                                                                                   |                                                                                   | 30.2                                                                                |                                                                                     | 27.2                                                                                | 32.4                                                                                |                                                                                     |
| Progression Factor                | 0.90                                                                              | 0.88                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                |                                                                                     | 0.84                                                                                | 0.78                                                                                |                                                                                     |
| Incremental Delay, d2             | 2.1                                                                               | 1.0                                                                               |                                                                                   | 0.2                                                                               | 0.9                                                                               |                                                                                   |                                                                                   | 1.3                                                                                 |                                                                                     | 0.1                                                                                 | 8.4                                                                                 |                                                                                     |
| Delay (s)                         | 8.9                                                                               | 7.3                                                                               |                                                                                   | 5.5                                                                               | 7.6                                                                               |                                                                                   |                                                                                   | 31.5                                                                                |                                                                                     | 23.0                                                                                | 33.7                                                                                |                                                                                     |
| Level of Service                  | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     | C                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 7.9                                                                               |                                                                                   |                                                                                   | 7.5                                                                               |                                                                                   |                                                                                   | 31.5                                                                                |                                                                                     |                                                                                     | 33.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 15.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Level of Service         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.54                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | 10.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 70.3%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| ICU Level of Service              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 6: Maryland Ave &amp; Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |  |                                                                                   |  |                                                                                   |  |  |  |  |                                                                                     |
| Traffic Volume (vph)              | 12                                                                                | 4                                                                                 | 2                                                                                 | 302                                                                               | 0                                                                                 | 80                                                                                | 0                                                                                 | 332                                                                                 | 415                                                                                 | 21                                                                                  | 308                                                                                 | 0                                                                                   |
| Future Volume (vph)               | 12                                                                                | 4                                                                                 | 2                                                                                 | 302                                                                               | 0                                                                                 | 80                                                                                | 0                                                                                 | 332                                                                                 | 415                                                                                 | 21                                                                                  | 308                                                                                 | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 0.99                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.97                                                                              |                                                                                   | 1.00                                                                                | 0.96                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.98                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.85                                                                              |                                                                                   | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 1579                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1376                                                                              |                                                                                   | 1676                                                                                | 1363                                                                                | 1593                                                                                | 1676                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.18                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 1579                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1376                                                                              |                                                                                   | 1676                                                                                | 1363                                                                                | 301                                                                                 | 1676                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                |
| Adj. Flow (vph)                   | 17                                                                                | 6                                                                                 | 3                                                                                 | 425                                                                               | 0                                                                                 | 113                                                                               | 0                                                                                 | 468                                                                                 | 585                                                                                 | 30                                                                                  | 434                                                                                 | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 3                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                 | 0                                                                                   | 469                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 23                                                                                | 0                                                                                 | 425                                                                               | 0                                                                                 | 36                                                                                | 0                                                                                 | 468                                                                                 | 116                                                                                 | 30                                                                                  | 434                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 5                                                                                 |                                                                                   | 5                                                                                 | 5                                                                                 |                                                                                   | 5                                                                                 | 5                                                                                 |                                                                                     | 8                                                                                   | 8                                                                                   |                                                                                     | 5                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                |                                                                                   | Prot                                                                              |                                                                                   | Perm                                                                              |                                                                                   | NA                                                                                  | Perm                                                                                | pm+pt                                                                               | NA                                                                                  |                                                                                     |
| Protected Phases                  | 3                                                                                 | 3                                                                                 |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   |                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 4                                                                                 |                                                                                   |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 2.6                                                                               |                                                                                   | 28.8                                                                              |                                                                                   | 28.8                                                                              |                                                                                   | 17.8                                                                                | 17.8                                                                                | 45.1                                                                                | 45.1                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 2.6                                                                               |                                                                                   | 28.8                                                                              |                                                                                   | 28.8                                                                              |                                                                                   | 17.8                                                                                | 17.8                                                                                | 45.1                                                                                | 45.1                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.03                                                                              |                                                                                   | 0.32                                                                              |                                                                                   | 0.32                                                                              |                                                                                   | 0.20                                                                                | 0.20                                                                                | 0.50                                                                                | 0.50                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 4.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 5.0                                                                                 | 5.0                                                                                 | 3.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 45                                                                                |                                                                                   | 509                                                                               |                                                                                   | 440                                                                               |                                                                                   | 331                                                                                 | 269                                                                                 | 478                                                                                 | 839                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.01                                                                             |                                                                                   | c0.27                                                                             |                                                                                   |                                                                                   |                                                                                   | c0.28                                                                               |                                                                                     | 0.02                                                                                | c0.26                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.03                                                                              |                                                                                   |                                                                                     | 0.08                                                                                | 0.02                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.51                                                                              |                                                                                   | 0.83                                                                              |                                                                                   | 0.08                                                                              |                                                                                   | 1.41                                                                                | 0.43                                                                                | 0.06                                                                                | 0.52                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 43.1                                                                              |                                                                                   | 28.4                                                                              |                                                                                   | 21.4                                                                              |                                                                                   | 36.1                                                                                | 31.7                                                                                | 13.3                                                                                | 15.1                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   | 1.16                                                                              |                                                                                   | 3.26                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 12.5                                                                              |                                                                                   | 10.1                                                                              |                                                                                   | 0.0                                                                               |                                                                                   | 203.3                                                                               | 5.0                                                                                 | 0.3                                                                                 | 2.3                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 55.6                                                                              |                                                                                   | 43.0                                                                              |                                                                                   | 69.7                                                                              |                                                                                   | 239.4                                                                               | 36.6                                                                                | 13.6                                                                                | 17.4                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 |                                                                                   | E                                                                                 |                                                                                   | F                                                                                   | D                                                                                   | B                                                                                   | B                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 55.6                                                                              |                                                                                   |                                                                                   | 48.6                                                                              |                                                                                   |                                                                                   | 126.7                                                                               |                                                                                     |                                                                                     | 17.1                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 81.2                                                                              |                                                                                   |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                     |                                                                                     | F                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.88                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                     |                                                                                     | 18.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 51.8%                                                                             |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
7: MD 355 & E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                | ↑                                                                                 | ↑↑                                                                                | ↑↑↑                                                                                 |                                                                                     | ↑↑                                                                                  | ↑↑↑                                                                                 |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 591                                                                               | 238                                                                               | 0                                                                                 | 443                                                                               | 378                                                                               | 267                                                                               | 1003                                                                                | 0                                                                                   | 535                                                                                 | 847                                                                                 | 61                                                                                  |
| Future Volume (vph)               | 0                                                                                 | 591                                                                               | 238                                                                               | 0                                                                                 | 443                                                                               | 378                                                                               | 267                                                                               | 1003                                                                                | 0                                                                                   | 535                                                                                 | 847                                                                                 | 61                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                               | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              | 1.00                                                                              | 0.97                                                                              | 0.91                                                                                |                                                                                     | 0.97                                                                                | 0.91                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.96                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.99                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 3048                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                              | 4577                                                                                |                                                                                     | 3090                                                                                | 4523                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 3048                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                              | 4577                                                                                |                                                                                     | 3090                                                                                | 4523                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 603                                                                               | 243                                                                               | 0                                                                                 | 452                                                                               | 386                                                                               | 272                                                                               | 1023                                                                                | 0                                                                                   | 546                                                                                 | 864                                                                                 | 62                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 24                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 244                                                                               | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 4                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 822                                                                               | 0                                                                                 | 0                                                                                 | 452                                                                               | 142                                                                               | 272                                                                               | 1023                                                                                | 0                                                                                   | 546                                                                                 | 922                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 5                                                                                   |
| Turn Type                         |                                                                                   | NA                                                                                |                                                                                   |                                                                                   | NA                                                                                | Perm                                                                              | Prot                                                                              | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 1                                                                                 | 5                                                                                   |                                                                                     | 6                                                                                   | 2                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 51.0                                                                              |                                                                                   |                                                                                   | 51.0                                                                              | 51.0                                                                              | 25.0                                                                              | 76.0                                                                                |                                                                                     | 27.0                                                                                | 78.0                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 51.0                                                                              |                                                                                   |                                                                                   | 51.0                                                                              | 51.0                                                                              | 25.0                                                                              | 76.0                                                                                |                                                                                     | 27.0                                                                                | 78.0                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.28                                                                              |                                                                                   |                                                                                   | 0.28                                                                              | 0.28                                                                              | 0.14                                                                              | 0.42                                                                                |                                                                                     | 0.15                                                                                | 0.43                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                               | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 7.0                                                                               | 0.2                                                                                 |                                                                                     | 5.0                                                                                 | 0.2                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 863                                                                               |                                                                                   |                                                                                   | 902                                                                               | 403                                                                               | 429                                                                               | 1932                                                                                |                                                                                     | 463                                                                                 | 1959                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.27                                                                             |                                                                                   |                                                                                   | 0.14                                                                              |                                                                                   | 0.09                                                                              | c0.22                                                                               |                                                                                     | c0.18                                                                               | 0.20                                                                                |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.10                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.50                                                                              | 0.35                                                                              | 0.63                                                                              | 0.53                                                                                |                                                                                     | 1.18                                                                                | 0.47                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 63.3                                                                              |                                                                                   |                                                                                   | 53.9                                                                              | 51.4                                                                              | 73.2                                                                              | 38.7                                                                                |                                                                                     | 76.5                                                                                | 36.3                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 0.90                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 13.3                                                                              |                                                                                   |                                                                                   | 2.0                                                                               | 2.4                                                                               | 5.9                                                                               | 1.0                                                                                 |                                                                                     | 101.1                                                                               | 0.8                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 70.3                                                                              |                                                                                   |                                                                                   | 55.9                                                                              | 53.8                                                                              | 79.0                                                                              | 39.7                                                                                |                                                                                     | 177.6                                                                               | 37.1                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | D                                                                                 | E                                                                                 | D                                                                                   |                                                                                     | F                                                                                   | D                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 70.3                                                                              |                                                                                   |                                                                                   | 54.9                                                                              |                                                                                   |                                                                                   | 48.0                                                                                |                                                                                     |                                                                                     | 89.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                   |                                                                                     |                                                                                     | F                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 67.2                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                   | E                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.78                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 180.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                   | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 86.8%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                   | E                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 1: Monroe St &amp; E Middle Ln

| Movement              | EB  | WB  | WB  | NB |
|-----------------------|-----|-----|-----|----|
| Directions Served     | T   | T   | T   | R  |
| Maximum Queue (ft)    | 31  | 44  | 6   | 57 |
| Average Queue (ft)    | 1   | 4   | 0   | 26 |
| 95th Queue (ft)       | 12  | 25  | 5   | 52 |
| Link Distance (ft)    | 640 | 187 | 187 |    |
| Upstream Blk Time (%) |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |    |
| Storage Bay Dist (ft) |     |     |     |    |
| Storage Blk Time (%)  |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |    |

## Intersection: 2: Monroe St &amp; E Montgomery Ave

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Intersection: 3: Monroe St &amp; Monroe Pl

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 4: Monroe St &amp; E Jefferson St

| Movement              | EB  | EB  | EB  | WB  | WB  | WB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | T   | TR  | L   | T   | TR  | L   | TR  | L   | TR  |
| Maximum Queue (ft)    | 92  | 198 | 261 | 150 | 394 | 419 | 148 | 232 | 60  | 143 |
| Average Queue (ft)    | 38  | 110 | 156 | 75  | 204 | 222 | 56  | 120 | 14  | 74  |
| 95th Queue (ft)       | 77  | 182 | 233 | 155 | 368 | 380 | 110 | 197 | 45  | 127 |
| Link Distance (ft)    |     | 546 | 546 |     | 886 | 886 |     | 433 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 250 |     |     | 125 |     |     | 225 |     | 150 |     |
| Storage Blk Time (%)  |     | 0   |     | 0   | 15  |     |     | 0   |     | 0   |
| Queuing Penalty (veh) |     | 0   |     | 1   | 15  |     |     | 0   |     | 0   |

## Intersection: 5: Monroe St &amp; Fleet St

| Movement              | EB  | EB  | WB  | WB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | TR  | L   | TR  | LTR | L   | TR  |
| Maximum Queue (ft)    | 124 | 245 | 33  | 176 | 165 | 90  | 120 |
| Average Queue (ft)    | 60  | 90  | 5   | 71  | 77  | 31  | 50  |
| 95th Queue (ft)       | 112 | 185 | 23  | 136 | 138 | 68  | 95  |
| Link Distance (ft)    |     | 361 | 580 | 580 | 528 |     | 433 |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |     |     | 175 |     |
| Storage Blk Time (%)  | 2   | 4   |     |     |     |     | 0   |
| Queuing Penalty (veh) | 6   | 6   |     |     |     |     | 0   |

## Intersection: 6: Maryland Ave &amp; Fleet St

| Movement              | EB  | WB  | WB  | NB  | NB  | SB | SB  |
|-----------------------|-----|-----|-----|-----|-----|----|-----|
| Directions Served     | LTR | L   | R   | T   | R   | L  | T   |
| Maximum Queue (ft)    | 29  | 248 | 282 | 220 | 91  | 71 | 132 |
| Average Queue (ft)    | 4   | 167 | 53  | 116 | 22  | 27 | 49  |
| 95th Queue (ft)       | 18  | 250 | 157 | 195 | 67  | 58 | 107 |
| Link Distance (ft)    | 141 |     | 361 | 646 |     |    | 432 |
| Upstream Blk Time (%) |     |     | 0   |     |     |    |     |
| Queuing Penalty (veh) |     |     | 0   |     |     |    |     |
| Storage Bay Dist (ft) |     | 225 |     | 450 | 125 |    |     |
| Storage Blk Time (%)  |     | 3   |     |     |     |    | 0   |
| Queuing Penalty (veh) |     | 3   |     |     |     |    | 0   |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | EB  | EB  | WB  | WB  | WB  | NB  | NB  | NB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | T   | TR  | T   | T   | R   | L   | L   | T   | T   | T   | L   | L   |
| Maximum Queue (ft)    | 238 | 341 | 397 | 343 | 56  | 136 | 183 | 227 | 192 | 168 | 212 | 272 |
| Average Queue (ft)    | 107 | 124 | 247 | 221 | 5   | 45  | 97  | 143 | 127 | 65  | 104 | 157 |
| 95th Queue (ft)       | 193 | 259 | 357 | 325 | 30  | 125 | 167 | 206 | 187 | 153 | 205 | 234 |
| Link Distance (ft)    | 886 | 886 | 941 | 941 | 941 |     |     | 760 | 760 | 760 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     | 275 | 275 |     |     |     | 425 | 425 |
| Storage Blk Time (%)  |     |     |     |     |     |     |     | 0   |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     | 0   |     |     |     |     |

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | T   | T   | TR  |
| Maximum Queue (ft)    | 364 | 344 | 307 |
| Average Queue (ft)    | 243 | 227 | 172 |
| 95th Queue (ft)       | 337 | 312 | 272 |
| Link Distance (ft)    | 658 | 658 | 658 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Network Summary

Network wide Queuing Penalty: 32

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 1: Monroe St &amp; E Middle Ln

| Movement              | EB  | EB  | WB  | WB  | NB |
|-----------------------|-----|-----|-----|-----|----|
| Directions Served     | T   | TR  | T   | T   | R  |
| Maximum Queue (ft)    | 39  | 12  | 39  | 6   | 64 |
| Average Queue (ft)    | 4   | 1   | 3   | 0   | 26 |
| 95th Queue (ft)       | 22  | 9   | 19  | 4   | 53 |
| Link Distance (ft)    | 640 | 640 | 187 | 187 |    |
| Upstream Blk Time (%) |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |
| Storage Bay Dist (ft) |     |     |     |     |    |
| Storage Blk Time (%)  |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |

## Intersection: 2: Monroe St &amp; E Montgomery Ave

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Intersection: 3: Monroe St &amp; Monroe Pl

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## ATTACHMENT A

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 4: Monroe St &amp; E Jefferson St

| Movement              | EB  | EB  | EB  | WB  | WB  | WB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | T   | TR  | L   | T   | TR  | L   | TR  | L   | TR  |
| Maximum Queue (ft)    | 106 | 283 | 299 | 150 | 323 | 350 | 250 | 426 | 174 | 254 |
| Average Queue (ft)    | 31  | 173 | 168 | 62  | 217 | 235 | 122 | 284 | 69  | 131 |
| 95th Queue (ft)       | 77  | 255 | 260 | 152 | 313 | 327 | 285 | 460 | 148 | 226 |
| Link Distance (ft)    |     | 546 | 546 |     | 886 | 886 |     | 433 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     | 2   |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     | 6   |     |     |
| Storage Bay Dist (ft) | 250 |     |     | 125 |     |     | 225 |     | 150 |     |
| Storage Blk Time (%)  |     | 1   |     | 0   | 18  |     | 1   | 51  | 1   | 8   |
| Queuing Penalty (veh) |     | 0   |     | 0   | 9   |     | 3   | 33  | 2   | 5   |

## Intersection: 5: Monroe St &amp; Fleet St

| Movement              | EB  | EB  | WB  | WB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | TR  | L   | TR  | LTR | L   | TR  |
| Maximum Queue (ft)    | 122 | 165 | 29  | 153 | 121 | 67  | 201 |
| Average Queue (ft)    | 55  | 66  | 6   | 50  | 50  | 9   | 80  |
| 95th Queue (ft)       | 109 | 131 | 25  | 111 | 101 | 41  | 154 |
| Link Distance (ft)    |     | 361 | 580 | 580 | 528 |     | 433 |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |     |     | 175 |     |
| Storage Blk Time (%)  | 2   | 2   |     |     |     |     | 1   |
| Queuing Penalty (veh) | 6   | 3   |     |     |     |     | 0   |

## Intersection: 6: Maryland Ave &amp; Fleet St

| Movement              | EB  | WB  | WB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LTR | L   | R   | T   | R   | L   | T   |
| Maximum Queue (ft)    | 59  | 247 | 174 | 419 | 128 | 34  | 186 |
| Average Queue (ft)    | 16  | 175 | 44  | 204 | 14  | 9   | 72  |
| 95th Queue (ft)       | 44  | 248 | 122 | 359 | 124 | 30  | 143 |
| Link Distance (ft)    | 141 |     | 361 | 646 |     |     | 432 |
| Upstream Blk Time (%) |     |     |     | 0   |     |     |     |
| Queuing Penalty (veh) |     |     |     | 0   |     |     |     |
| Storage Bay Dist (ft) |     | 225 |     |     | 450 | 125 |     |
| Storage Blk Time (%)  |     | 2   |     | 0   | 0   |     | 1   |
| Queuing Penalty (veh) |     | 2   |     | 2   | 0   |     | 0   |



Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | EB  | EB  | WB  | WB  | WB  | NB  | NB  | NB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | T   | TR  | T   | T   | R   | L   | L   | T   | T   | T   | L   | L   |
| Maximum Queue (ft)    | 462 | 482 | 288 | 247 | 114 | 211 | 299 | 399 | 367 | 284 | 437 | 450 |
| Average Queue (ft)    | 277 | 320 | 160 | 135 | 14  | 87  | 160 | 262 | 236 | 176 | 432 | 449 |
| 95th Queue (ft)       | 424 | 462 | 244 | 224 | 61  | 180 | 279 | 377 | 335 | 282 | 452 | 453 |
| Link Distance (ft)    | 886 | 886 | 941 | 941 | 941 |     |     | 760 | 760 | 760 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     | 275 | 275 |     |     |     | 425 | 425 |
| Storage Blk Time (%)  |     |     |     |     |     | 0   | 5   |     |     |     | 16  | 72  |
| Queuing Penalty (veh) |     |     |     |     |     | 0   | 12  |     |     |     | 46  | 202 |

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | T   | T   | TR  |
| Maximum Queue (ft)    | 702 | 657 | 516 |
| Average Queue (ft)    | 666 | 442 | 267 |
| 95th Queue (ft)       | 755 | 707 | 433 |
| Link Distance (ft)    | 658 | 658 | 658 |
| Upstream Blk Time (%) | 72  | 0   |     |
| Queuing Penalty (veh) | 0   | 0   |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  | 0   |     |     |
| Queuing Penalty (veh) | 2   |     |     |

## Network Summary

Network wide Queuing Penalty: 334

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
1: Monroe St & E Middle Ln

04/14/2023

|                                   |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                |                                                                                   | ↑                                                                                 |
| Traffic Volume (veh/h)            | 229                                                                               | 14                                                                                | 0                                                                                 | 350                                                                               | 0                                                                                 | 42                                                                                |
| Future Volume (Veh/h)             | 229                                                                               | 14                                                                                | 0                                                                                 | 350                                                                               | 0                                                                                 | 42                                                                                |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              |
| Hourly flow rate (vph)            | 266                                                                               | 16                                                                                | 0                                                                                 | 407                                                                               | 0                                                                                 | 49                                                                                |
| Pedestrians                       | 11                                                                                |                                                                                   |                                                                                   | 1                                                                                 | 29                                                                                |                                                                                   |
| Lane Width (ft)                   | 12.0                                                                              |                                                                                   |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   |
| Walking Speed (ft/s)              | 3.5                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   |
| Percent Blockage                  | 1                                                                                 |                                                                                   |                                                                                   | 0                                                                                 | 3                                                                                 |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   | 311                                                                               |                                                                                   | 518                                                                               | 171                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 311                                                                               |                                                                                   | 518                                                                               | 171                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   | 6.8                                                                               | 6.9                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   | 100                                                                               |                                                                                   | 100                                                                               | 94                                                                                |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 1212                                                                              |                                                                                   | 469                                                                               | 819                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1                                                                              | WB 2                                                                              | NB 1                                                                              |                                                                                   |
| Volume Total                      | 177                                                                               | 105                                                                               | 204                                                                               | 204                                                                               | 49                                                                                |                                                                                   |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |
| Volume Right                      | 0                                                                                 | 16                                                                                | 0                                                                                 | 0                                                                                 | 49                                                                                |                                                                                   |
| cSH                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 819                                                                               |                                                                                   |
| Volume to Capacity                | 0.10                                                                              | 0.06                                                                              | 0.12                                                                              | 0.12                                                                              | 0.06                                                                              |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 5                                                                                 |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 9.7                                                                               |                                                                                   |
| Lane LOS                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 9.7                                                                               |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.6                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 21.5%                                                                             |                                                                                   | ICU Level of Service                                                              | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

ATTACHMENT A

# HCM Unsignalized Intersection Capacity Analysis 2: Monroe St & E Montgomery Ave

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              | Stop                                                                              |                                                                                   |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 3.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 917                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              | A                                                                                 |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

# HCM Unsignalized Intersection Capacity Analysis3: Monroe St & Monroe PI

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                    |  |  |                                                                                     |  |                                                                                     |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                    | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 4.5                                                                               | 4.5                                                                               | 4.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 806                                                                               | 806                                                                               | 900                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.3                                                                               | 6.3                                                                               | 7.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 4: Monroe St &amp; E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |                                                                                    |  |  |  |  |  |
| Traffic Volume (vph)              | 69                                                                                | 568                                                                               | 64                                                                                | 96                                                                                | 674                                                                               | 56                                                                                | 0                                                                                  | 135                                                                                 | 71                                                                                  | 15                                                                                  | 78                                                                                  | 41                                                                                  |
| Future Volume (vph)               | 69                                                                                | 568                                                                               | 64                                                                                | 96                                                                                | 674                                                                               | 56                                                                                | 0                                                                                  | 135                                                                                 | 71                                                                                  | 15                                                                                  | 78                                                                                  | 41                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   |                                                                                    | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   |                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                    | 1.00                                                                                | 0.92                                                                                | 1.00                                                                                | 0.94                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                    | 1.00                                                                                | 1.00                                                                                | 0.94                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   |                                                                                    | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 0.95                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |                                                                                    | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1591                                                                              | 3123                                                                              |                                                                                   | 1589                                                                              | 3140                                                                              |                                                                                   |                                                                                    | 1676                                                                                | 1311                                                                                | 1502                                                                                | 1501                                                                                |                                                                                     |
| Flt Permitted                     | 0.25                                                                              | 1.00                                                                              |                                                                                   | 0.29                                                                              | 1.00                                                                              |                                                                                   |                                                                                    | 1.00                                                                                | 1.00                                                                                | 0.67                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 422                                                                               | 3123                                                                              |                                                                                   | 493                                                                               | 3140                                                                              |                                                                                   |                                                                                    | 1676                                                                                | 1311                                                                                | 1052                                                                                | 1501                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                               | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                | 0.94                                                                                |
| Adj. Flow (vph)                   | 73                                                                                | 604                                                                               | 68                                                                                | 102                                                                               | 717                                                                               | 60                                                                                | 0                                                                                  | 144                                                                                 | 76                                                                                  | 16                                                                                  | 83                                                                                  | 44                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 73                                                                                | 672                                                                               | 0                                                                                 | 102                                                                               | 777                                                                               | 0                                                                                 | 0                                                                                  | 144                                                                                 | 76                                                                                  | 16                                                                                  | 127                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 8                                                                                 |                                                                                   | 16                                                                                | 16                                                                                |                                                                                   | 8                                                                                 | 66                                                                                 |                                                                                     | 59                                                                                  | 59                                                                                  |                                                                                     | 66                                                                                  |
| Turn Type                         | pm+pt                                                                             | NA                                                                                |                                                                                   | pm+pt                                                                             | NA                                                                                |                                                                                   |                                                                                    | NA                                                                                  | Perm                                                                                | Perm                                                                                |                                                                                     | NA                                                                                  |
| Protected Phases                  | 1                                                                                 | 6                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                 |                                                                                   |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     | 4                                                                                   |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                     | 8                                                                                   | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 39.5                                                                              | 34.0                                                                              |                                                                                   | 40.9                                                                              | 34.7                                                                              |                                                                                   |                                                                                    | 32.8                                                                                | 32.8                                                                                | 11.8                                                                                | 11.8                                                                                |                                                                                     |
| Effective Green, g (s)            | 39.5                                                                              | 34.0                                                                              |                                                                                   | 40.9                                                                              | 34.7                                                                              |                                                                                   |                                                                                    | 32.8                                                                                | 32.8                                                                                | 11.8                                                                                | 11.8                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.44                                                                              | 0.38                                                                              |                                                                                   | 0.45                                                                              | 0.39                                                                              |                                                                                   |                                                                                    | 0.36                                                                                | 0.36                                                                                | 0.13                                                                                | 0.13                                                                                |                                                                                     |
| Clearance Time (s)                | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   |                                                                                    | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |                                                                                    | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 256                                                                               | 1179                                                                              |                                                                                   | 299                                                                               | 1210                                                                              |                                                                                   |                                                                                    | 610                                                                                 | 477                                                                                 | 137                                                                                 | 196                                                                                 |                                                                                     |
| v/s Ratio Prot                    | 0.02                                                                              | 0.22                                                                              |                                                                                   | c0.02                                                                             | c0.25                                                                             |                                                                                   |                                                                                    | c0.09                                                                               |                                                                                     |                                                                                     | c0.08                                                                               |                                                                                     |
| v/s Ratio Perm                    | 0.11                                                                              |                                                                                   |                                                                                   | 0.13                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     | 0.06                                                                                | 0.02                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.29                                                                              | 0.57                                                                              |                                                                                   | 0.34                                                                              | 0.64                                                                              |                                                                                   |                                                                                    | 0.24                                                                                | 0.16                                                                                | 0.12                                                                                | 0.65                                                                                |                                                                                     |
| Uniform Delay, d1                 | 15.5                                                                              | 22.2                                                                              |                                                                                   | 14.8                                                                              | 22.6                                                                              |                                                                                   |                                                                                    | 19.9                                                                                | 19.3                                                                                | 34.5                                                                                | 37.1                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                    | 0.80                                                                                | 0.80                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 0.6                                                                               | 2.0                                                                               |                                                                                   | 0.7                                                                               | 2.6                                                                               |                                                                                   |                                                                                    | 0.2                                                                                 | 0.1                                                                                 | 0.4                                                                                 | 7.2                                                                                 |                                                                                     |
| Delay (s)                         | 16.1                                                                              | 24.2                                                                              |                                                                                   | 15.5                                                                              | 25.2                                                                              |                                                                                   |                                                                                    | 16.1                                                                                | 15.6                                                                                | 34.9                                                                                | 44.3                                                                                |                                                                                     |
| Level of Service                  | B                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   | B                                                                                   | C                                                                                   | D                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 23.4                                                                              |                                                                                   |                                                                                   | 24.1                                                                              |                                                                                   |                                                                                    | 15.9                                                                                |                                                                                     |                                                                                     | 43.3                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 24.3                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.51                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 19.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 62.7%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
5: Monroe St & Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 148                                                                               | 314                                                                               | 62                                                                                | 10                                                                                | 320                                                                               | 45                                                                                | 73                                                                                  | 39                                                                                  | 21                                                                                  | 43                                                                                  | 43                                                                                  | 83                                                                                  |
| Future Volume (vph)               | 148                                                                               | 314                                                                               | 62                                                                                | 10                                                                                | 320                                                                               | 45                                                                                | 73                                                                                  | 39                                                                                  | 21                                                                                  | 43                                                                                  | 43                                                                                  | 83                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                                 | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                                | 0.99                                                                                |                                                                                     | 1.00                                                                                | 0.93                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.94                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                                | 0.95                                                                                |                                                                                     | 1.00                                                                                | 0.90                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1567                                                                              | 1618                                                                              |                                                                                   | 1566                                                                              | 1633                                                                              |                                                                                   | 1497                                                                                | 1571                                                                                |                                                                                     | 1578                                                                                | 1407                                                                                |                                                                                     |
| Flt Permitted                     | 0.41                                                                              | 1.00                                                                              |                                                                                   | 0.40                                                                              | 1.00                                                                              |                                                                                   | 0.49                                                                                | 1.00                                                                                |                                                                                     | 0.70                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 677                                                                               | 1618                                                                              |                                                                                   | 660                                                                               | 1633                                                                              |                                                                                   | 769                                                                                 | 1571                                                                                |                                                                                     | 1159                                                                                | 1407                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                | 0.66                                                                                |
| Adj. Flow (vph)                   | 224                                                                               | 476                                                                               | 94                                                                                | 15                                                                                | 485                                                                               | 68                                                                                | 111                                                                                 | 59                                                                                  | 32                                                                                  | 65                                                                                  | 65                                                                                  | 126                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                 | 4                                                                                 | 0                                                                                 | 0                                                                                   | 26                                                                                  | 0                                                                                   | 0                                                                                   | 94                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 224                                                                               | 565                                                                               | 0                                                                                 | 15                                                                                | 549                                                                               | 0                                                                                 | 111                                                                                 | 65                                                                                  | 0                                                                                   | 65                                                                                  | 97                                                                                  | 0                                                                                   |
| Confl. Peds. (#/hr)               | 20                                                                                |                                                                                   | 19                                                                                | 19                                                                                |                                                                                   | 20                                                                                | 40                                                                                  |                                                                                     | 5                                                                                   | 5                                                                                   |                                                                                     | 40                                                                                  |
| Turn Type                         | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                                | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 63.9                                                                              | 63.9                                                                              |                                                                                   | 63.9                                                                              | 63.9                                                                              |                                                                                   | 16.1                                                                                | 16.1                                                                                |                                                                                     | 16.1                                                                                | 16.1                                                                                |                                                                                     |
| Effective Green, g (s)            | 63.9                                                                              | 63.9                                                                              |                                                                                   | 63.9                                                                              | 63.9                                                                              |                                                                                   | 16.1                                                                                | 16.1                                                                                |                                                                                     | 16.1                                                                                | 16.1                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.71                                                                              | 0.71                                                                              |                                                                                   | 0.71                                                                              | 0.71                                                                              |                                                                                   | 0.18                                                                                | 0.18                                                                                |                                                                                     | 0.18                                                                                | 0.18                                                                                |                                                                                     |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                                 | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 480                                                                               | 1148                                                                              |                                                                                   | 468                                                                               | 1159                                                                              |                                                                                   | 137                                                                                 | 281                                                                                 |                                                                                     | 207                                                                                 | 251                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.35                                                                             |                                                                                   |                                                                                   | 0.34                                                                              |                                                                                   |                                                                                     | 0.04                                                                                |                                                                                     |                                                                                     | 0.07                                                                                |                                                                                     |
| v/s Ratio Perm                    | 0.33                                                                              |                                                                                   |                                                                                   | 0.02                                                                              |                                                                                   |                                                                                   | c0.14                                                                               |                                                                                     |                                                                                     | 0.06                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.47                                                                              | 0.49                                                                              |                                                                                   | 0.03                                                                              | 0.47                                                                              |                                                                                   | 0.81                                                                                | 0.23                                                                                |                                                                                     | 0.31                                                                                | 0.39                                                                                |                                                                                     |
| Uniform Delay, d1                 | 5.7                                                                               | 5.8                                                                               |                                                                                   | 3.9                                                                               | 5.7                                                                               |                                                                                   | 35.5                                                                                | 31.6                                                                                |                                                                                     | 32.1                                                                                | 32.6                                                                                |                                                                                     |
| Progression Factor                | 0.83                                                                              | 0.81                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.90                                                                                | 0.86                                                                                |                                                                                     |
| Incremental Delay, d2             | 2.8                                                                               | 1.3                                                                               |                                                                                   | 0.1                                                                               | 1.4                                                                               |                                                                                   | 29.1                                                                                | 0.4                                                                                 |                                                                                     | 0.8                                                                                 | 0.9                                                                                 |                                                                                     |
| Delay (s)                         | 7.5                                                                               | 6.0                                                                               |                                                                                   | 4.0                                                                               | 7.1                                                                               |                                                                                   | 64.6                                                                                | 32.1                                                                                |                                                                                     | 29.7                                                                                | 29.0                                                                                |                                                                                     |
| Level of Service                  | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 | A                                                                                 |                                                                                   | E                                                                                   | C                                                                                   |                                                                                     | C                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 6.4                                                                               |                                                                                   |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     | 49.9                                                                                |                                                                                     |                                                                                     | 29.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 14.6                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.56                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                     | 10.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 80.5%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 6: Maryland Ave &amp; Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |  |                                                                                   |  |                                                                                   |  |  |  |  |                                                                                     |
| Traffic Volume (vph)              | 2                                                                                 | 1                                                                                 | 1                                                                                 | 315                                                                               | 0                                                                                 | 171                                                                               | 0                                                                                 | 276                                                                                 | 451                                                                                 | 87                                                                                  | 245                                                                                 | 0                                                                                   |
| Future Volume (vph)               | 2                                                                                 | 1                                                                                 | 1                                                                                 | 315                                                                               | 0                                                                                 | 171                                                                               | 0                                                                                 | 276                                                                                 | 451                                                                                 | 87                                                                                  | 245                                                                                 | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 0.98                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.97                                                                              |                                                                                   | 1.00                                                                                | 0.97                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.97                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.85                                                                              |                                                                                   | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 1545                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1384                                                                              |                                                                                   | 1676                                                                                | 1388                                                                                | 1593                                                                                | 1676                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.27                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 1545                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1384                                                                              |                                                                                   | 1676                                                                                | 1388                                                                                | 456                                                                                 | 1676                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                |
| Adj. Flow (vph)                   | 3                                                                                 | 1                                                                                 | 1                                                                                 | 399                                                                               | 0                                                                                 | 216                                                                               | 0                                                                                 | 349                                                                                 | 571                                                                                 | 110                                                                                 | 310                                                                                 | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 149                                                                               | 0                                                                                 | 0                                                                                   | 407                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 4                                                                                 | 0                                                                                 | 399                                                                               | 0                                                                                 | 67                                                                                | 0                                                                                 | 349                                                                                 | 164                                                                                 | 110                                                                                 | 310                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 3                                                                                 |                                                                                   | 3                                                                                 | 3                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 |                                                                                     | 2                                                                                   | 2                                                                                   |                                                                                     | 7                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                |                                                                                   | Prot                                                                              |                                                                                   | Perm                                                                              |                                                                                   | NA                                                                                  | Perm                                                                                | pm+pt                                                                               | NA                                                                                  |                                                                                     |
| Protected Phases                  | 3                                                                                 | 3                                                                                 |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   |                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 4                                                                                 |                                                                                   |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 1.3                                                                               |                                                                                   | 28.0                                                                              |                                                                                   | 28.0                                                                              |                                                                                   | 25.9                                                                                | 25.9                                                                                | 47.2                                                                                | 47.2                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 1.3                                                                               |                                                                                   | 28.0                                                                              |                                                                                   | 28.0                                                                              |                                                                                   | 25.9                                                                                | 25.9                                                                                | 47.2                                                                                | 47.2                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.01                                                                              |                                                                                   | 0.31                                                                              |                                                                                   | 0.31                                                                              |                                                                                   | 0.29                                                                                | 0.29                                                                                | 0.52                                                                                | 0.52                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 4.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 5.0                                                                                 | 5.0                                                                                 | 3.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 22                                                                                |                                                                                   | 495                                                                               |                                                                                   | 430                                                                               |                                                                                   | 482                                                                                 | 399                                                                                 | 451                                                                                 | 878                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.00                                                                             |                                                                                   | c0.25                                                                             |                                                                                   |                                                                                   |                                                                                   | c0.21                                                                               |                                                                                     | 0.05                                                                                | c0.18                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.05                                                                              |                                                                                   |                                                                                     | 0.12                                                                                | 0.08                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.18                                                                              |                                                                                   | 0.81                                                                              |                                                                                   | 0.16                                                                              |                                                                                   | 0.72                                                                                | 0.41                                                                                | 0.24                                                                                | 0.35                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 43.8                                                                              |                                                                                   | 28.5                                                                              |                                                                                   | 22.4                                                                              |                                                                                   | 28.8                                                                                | 25.9                                                                                | 12.4                                                                                | 12.5                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   | 1.13                                                                              |                                                                                   | 1.90                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 5.4                                                                               |                                                                                   | 8.0                                                                               |                                                                                   | 0.1                                                                               |                                                                                   | 9.1                                                                                 | 3.1                                                                                 | 1.3                                                                                 | 1.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 49.2                                                                              |                                                                                   | 40.4                                                                              |                                                                                   | 42.7                                                                              |                                                                                   | 38.0                                                                                | 29.0                                                                                | 13.7                                                                                | 13.6                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   | D                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 49.2                                                                              |                                                                                   |                                                                                   | 41.2                                                                              |                                                                                   |                                                                                   | 32.4                                                                                |                                                                                     |                                                                                     | 13.6                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 31.2                                                                              |                                                                                   |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                     |                                                                                     | 18.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 58.4%                                                                             |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
7: MD 355 & E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   | ↑↑                                                                                |                                                                                   |                                                                                   | ↑↑                                                                                | ↑                                                                                 | ↑↑                                                                                 | ↑↑↑                                                                                 |                                                                                     | ↑↑                                                                                  | ↑↑↑                                                                                 |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 307                                                                               | 305                                                                               | 0                                                                                 | 683                                                                               | 387                                                                               | 170                                                                                | 525                                                                                 | 0                                                                                   | 325                                                                                 | 1208                                                                                | 49                                                                                  |
| Future Volume (vph)               | 0                                                                                 | 307                                                                               | 305                                                                               | 0                                                                                 | 683                                                                               | 387                                                                               | 170                                                                                | 525                                                                                 | 0                                                                                   | 325                                                                                 | 1208                                                                                | 49                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              | 1.00                                                                              | 0.97                                                                               | 0.91                                                                                |                                                                                     | 0.97                                                                                | 0.91                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.93                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.99                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 2947                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4544                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 2947                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4544                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                               | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 313                                                                               | 311                                                                               | 0                                                                                 | 697                                                                               | 395                                                                               | 173                                                                                | 536                                                                                 | 0                                                                                   | 332                                                                                 | 1233                                                                                | 50                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 120                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 284                                                                               | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 3                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 504                                                                               | 0                                                                                 | 0                                                                                 | 697                                                                               | 111                                                                               | 173                                                                                | 536                                                                                 | 0                                                                                   | 332                                                                                 | 1280                                                                                | 0                                                                                   |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 10                                                                                  |
| Turn Type                         |                                                                                   | NA                                                                                |                                                                                   |                                                                                   | NA                                                                                | Perm                                                                              | Prot                                                                               | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 1                                                                                  | 5                                                                                   |                                                                                     | 6                                                                                   | 2                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 38.0                                                                              |                                                                                   |                                                                                   | 38.0                                                                              | 38.0                                                                              | 13.0                                                                               | 45.0                                                                                |                                                                                     | 41.0                                                                                | 73.0                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 38.0                                                                              |                                                                                   |                                                                                   | 38.0                                                                              | 38.0                                                                              | 13.0                                                                               | 45.0                                                                                |                                                                                     | 41.0                                                                                | 73.0                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.25                                                                              |                                                                                   |                                                                                   | 0.25                                                                              | 0.25                                                                              | 0.09                                                                               | 0.30                                                                                |                                                                                     | 0.27                                                                                | 0.49                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 7.0                                                                                | 0.2                                                                                 |                                                                                     | 5.0                                                                                 | 0.2                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 746                                                                               |                                                                                   |                                                                                   | 806                                                                               | 361                                                                               | 267                                                                                | 1373                                                                                |                                                                                     | 844                                                                                 | 2211                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | 0.17                                                                              |                                                                                   |                                                                                   | c0.22                                                                             |                                                                                   | c0.06                                                                              | 0.12                                                                                |                                                                                     | 0.11                                                                                | c0.28                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.08                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.68                                                                              |                                                                                   |                                                                                   | 0.86                                                                              | 0.31                                                                              | 0.65                                                                               | 0.39                                                                                |                                                                                     | 0.39                                                                                | 0.58                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 50.4                                                                              |                                                                                   |                                                                                   | 53.5                                                                              | 45.3                                                                              | 66.3                                                                               | 41.6                                                                                |                                                                                     | 44.4                                                                                | 27.5                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 4.9                                                                               |                                                                                   |                                                                                   | 11.9                                                                              | 2.2                                                                               | 9.9                                                                                | 0.8                                                                                 |                                                                                     | 1.4                                                                                 | 1.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 55.3                                                                              |                                                                                   |                                                                                   | 65.5                                                                              | 47.5                                                                              | 76.2                                                                               | 42.5                                                                                |                                                                                     | 45.8                                                                                | 28.6                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | D                                                                                 | E                                                                                  | D                                                                                   |                                                                                     | D                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 55.3                                                                              |                                                                                   |                                                                                   | 59.0                                                                              |                                                                                   |                                                                                    | 50.7                                                                                |                                                                                     |                                                                                     | 32.1                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 46.2                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 150.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                    | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 75.2%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
1: Monroe St & E Middle Ln

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |                                                                                   |  |
| Traffic Volume (veh/h)            | 435                                                                               | 4                                                                                 | 0                                                                                 | 322                                                                               | 0                                                                                 | 51                                                                                |
| Future Volume (Veh/h)             | 435                                                                               | 4                                                                                 | 0                                                                                 | 322                                                                               | 0                                                                                 | 51                                                                                |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              | 0.87                                                                              |
| Hourly flow rate (vph)            | 500                                                                               | 5                                                                                 | 0                                                                                 | 370                                                                               | 0                                                                                 | 59                                                                                |
| Pedestrians                       | 12                                                                                |                                                                                   |                                                                                   | 2                                                                                 | 38                                                                                |                                                                                   |
| Lane Width (ft)                   | 12.0                                                                              |                                                                                   |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   |
| Walking Speed (ft/s)              | 3.5                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   |
| Percent Blockage                  | 1                                                                                 |                                                                                   |                                                                                   | 0                                                                                 | 4                                                                                 |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   | 543                                                                               | 738 292                                                                           |                                                                                   |                                                                                   |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 543                                                                               | 738 292                                                                           |                                                                                   |                                                                                   |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               | 6.8 6.9                                                                           |                                                                                   |                                                                                   |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               | 3.5 3.3                                                                           |                                                                                   |                                                                                   |
| p0 queue free %                   |                                                                                   |                                                                                   | 100                                                                               | 100 91                                                                            |                                                                                   |                                                                                   |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 985                                                                               | 337 677                                                                           |                                                                                   |                                                                                   |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1                                                                              | WB 2                                                                              | NB 1                                                                              |                                                                                   |
| Volume Total                      | 333                                                                               | 172                                                                               | 185                                                                               | 185                                                                               | 59                                                                                |                                                                                   |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |
| Volume Right                      | 0                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                 | 59                                                                                |                                                                                   |
| cSH                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 677                                                                               |                                                                                   |
| Volume to Capacity                | 0.20                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.09                                                                              |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 7                                                                                 |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 10.8                                                                              |                                                                                   |
| Lane LOS                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   | 10.8                                                                              |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.7                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 24.5%                                                                             | ICU Level of Service                                                              |                                                                                   | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

## ATTACHMENT A

HCM Unsignalized Intersection Capacity Analysis  
2: Monroe St & E Montgomery Ave

04/14/2023

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              | Stop                                                                              |                                                                                   |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 3.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 917                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              | ICU Level of Service                                                              | A                                                                                 |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

ATTACHMENT A

# HCM Unsignalized Intersection Capacity Analysis 3: Monroe St & Monroe PI

04/14/2023

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| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |                                                                                    |  |  |                                                                                     |  |                                                                                     |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                    | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |
| Traffic Volume (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Future Volume (vph)               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Hourly flow rate (vph)            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Total (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Left (vph)                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Right (vph)                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Hadj (s)                          | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Departure Headway (s)             | 3.9                                                                               | 3.9                                                                               | 4.5                                                                               | 4.5                                                                               | 4.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Degree Utilization, x             | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Capacity (veh/h)                  | 917                                                                               | 917                                                                               | 806                                                                               | 806                                                                               | 900                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Control Delay (s)                 | 6.9                                                                               | 6.9                                                                               | 6.3                                                                               | 6.3                                                                               | 7.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Delay                             |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Level of Service                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 0.0%                                                                              |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                    |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 4: Monroe St &amp; E Jefferson St

04/14/2023

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| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |                                                                                   |  |  |  |  |                                                                                     |
| Traffic Volume (vph)              | 47                                                                                | 744                                                                               | 37                                                                                | 53                                                                                | 652                                                                               | 30                                                                                | 0                                                                                 | 106                                                                                 | 183                                                                                 | 62                                                                                  | 97                                                                                  | 96                                                                                  |
| Future Volume (vph)               | 47                                                                                | 744                                                                               | 37                                                                                | 53                                                                                | 652                                                                               | 30                                                                                | 0                                                                                 | 106                                                                                 | 183                                                                                 | 62                                                                                  | 97                                                                                  | 96                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   |                                                                                   | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                | 0.93                                                                                | 1.00                                                                                | 0.93                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   |                                                                                   | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 0.93                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1591                                                                              | 3156                                                                              |                                                                                   | 1591                                                                              | 3159                                                                              |                                                                                   |                                                                                   | 1676                                                                                | 1328                                                                                | 1515                                                                                | 1443                                                                                |                                                                                     |
| Flt Permitted                     | 0.27                                                                              | 1.00                                                                              |                                                                                   | 0.18                                                                              | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.68                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 445                                                                               | 3156                                                                              |                                                                                   | 308                                                                               | 3159                                                                              |                                                                                   |                                                                                   | 1676                                                                                | 1328                                                                                | 1089                                                                                | 1443                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 51                                                                                | 809                                                                               | 40                                                                                | 58                                                                                | 709                                                                               | 33                                                                                | 0                                                                                 | 115                                                                                 | 199                                                                                 | 67                                                                                  | 105                                                                                 | 104                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 51                                                                                | 849                                                                               | 0                                                                                 | 58                                                                                | 742                                                                               | 0                                                                                 | 0                                                                                 | 115                                                                                 | 199                                                                                 | 67                                                                                  | 209                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 8                                                                                 |                                                                                   | 19                                                                                | 19                                                                                |                                                                                   | 8                                                                                 | 77                                                                                |                                                                                     | 49                                                                                  | 49                                                                                  |                                                                                     | 77                                                                                  |
| Turn Type                         | pm+pt                                                                             | NA                                                                                |                                                                                   | pm+pt                                                                             | NA                                                                                |                                                                                   |                                                                                   | NA                                                                                  | Perm                                                                                | Perm                                                                                |                                                                                     | NA                                                                                  |
| Protected Phases                  | 1                                                                                 | 6                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     | 4                                                                                   |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     | 8                                                                                   | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 35.0                                                                              | 32.0                                                                              |                                                                                   | 37.4                                                                              | 33.2                                                                              |                                                                                   |                                                                                   | 36.8                                                                                | 36.8                                                                                | 15.8                                                                                | 15.8                                                                                |                                                                                     |
| Effective Green, g (s)            | 35.0                                                                              | 32.0                                                                              |                                                                                   | 37.4                                                                              | 33.2                                                                              |                                                                                   |                                                                                   | 36.8                                                                                | 36.8                                                                                | 15.8                                                                                | 15.8                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.39                                                                              | 0.36                                                                              |                                                                                   | 0.42                                                                              | 0.37                                                                              |                                                                                   |                                                                                   | 0.41                                                                                | 0.41                                                                                | 0.18                                                                                | 0.18                                                                                |                                                                                     |
| Clearance Time (s)                | 5.5                                                                               | 5.5                                                                               |                                                                                   | 5.5                                                                               | 5.5                                                                               |                                                                                   |                                                                                   | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |                                                                                   | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 211                                                                               | 1122                                                                              |                                                                                   | 187                                                                               | 1165                                                                              |                                                                                   |                                                                                   | 685                                                                                 | 543                                                                                 | 191                                                                                 | 253                                                                                 |                                                                                     |
| v/s Ratio Prot                    | 0.01                                                                              | c0.27                                                                             |                                                                                   | c0.01                                                                             | 0.23                                                                              |                                                                                   |                                                                                   | 0.07                                                                                |                                                                                     |                                                                                     | c0.14                                                                               |                                                                                     |
| v/s Ratio Perm                    | 0.09                                                                              |                                                                                   |                                                                                   | 0.11                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     | c0.15                                                                               | 0.06                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.24                                                                              | 0.76                                                                              |                                                                                   | 0.31                                                                              | 0.64                                                                              |                                                                                   |                                                                                   | 0.17                                                                                | 0.37                                                                                | 0.35                                                                                | 0.83                                                                                |                                                                                     |
| Uniform Delay, d1                 | 17.9                                                                              | 25.6                                                                              |                                                                                   | 17.3                                                                              | 23.4                                                                              |                                                                                   |                                                                                   | 16.9                                                                                | 18.5                                                                                | 32.6                                                                                | 35.8                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.16                                                                              | 1.65                                                                              |                                                                                   |                                                                                   | 0.65                                                                                | 0.66                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 0.6                                                                               | 4.8                                                                               |                                                                                   | 0.9                                                                               | 2.4                                                                               |                                                                                   |                                                                                   | 0.1                                                                                 | 0.4                                                                                 | 1.1                                                                                 | 19.3                                                                                |                                                                                     |
| Delay (s)                         | 18.5                                                                              | 30.3                                                                              |                                                                                   | 20.9                                                                              | 41.1                                                                              |                                                                                   |                                                                                   | 11.0                                                                                | 12.7                                                                                | 33.7                                                                                | 55.1                                                                                |                                                                                     |
| Level of Service                  | B                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   |                                                                                   | B                                                                                   | B                                                                                   | C                                                                                   | E                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 29.7                                                                              |                                                                                   |                                                                                   | 39.6                                                                              |                                                                                   |                                                                                   | 12.1                                                                                |                                                                                     |                                                                                     | 49.9                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 33.2                                                                              |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.64                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                   | 19.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 62.4%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
5: Monroe St & Fleet St

04/14/2023

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| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (vph)              | 157                                                                               | 189                                                                               | 83                                                                                | 13                                                                                | 210                                                                               | 14                                                                                | 46                                                                                  | 31                                                                                  | 7                                                                                   | 9                                                                                   | 73                                                                                  | 134                                                                                 |
| Future Volume (vph)               | 157                                                                               | 189                                                                               | 83                                                                                | 13                                                                                | 210                                                                               | 14                                                                                | 46                                                                                  | 31                                                                                  | 7                                                                                   | 9                                                                                   | 73                                                                                  | 134                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                                 | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                                | 0.99                                                                                |                                                                                     | 1.00                                                                                | 0.98                                                                                |                                                                                     |
| Flpb, ped/bikes                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                                | 1.00                                                                                |                                                                                     | 0.96                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                                | 0.97                                                                                |                                                                                     | 1.00                                                                                | 0.90                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1576                                                                              | 1564                                                                              |                                                                                   | 1553                                                                              | 1657                                                                              |                                                                                   | 1582                                                                                | 1611                                                                                |                                                                                     | 1533                                                                                | 1480                                                                                |                                                                                     |
| Flt Permitted                     | 0.51                                                                              | 1.00                                                                              |                                                                                   | 0.46                                                                              | 1.00                                                                              |                                                                                   | 0.24                                                                                | 1.00                                                                                |                                                                                     | 0.72                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 851                                                                               | 1564                                                                              |                                                                                   | 747                                                                               | 1657                                                                              |                                                                                   | 406                                                                                 | 1611                                                                                |                                                                                     | 1154                                                                                | 1480                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                |
| Adj. Flow (vph)                   | 262                                                                               | 315                                                                               | 138                                                                               | 22                                                                                | 350                                                                               | 23                                                                                | 77                                                                                  | 52                                                                                  | 12                                                                                  | 15                                                                                  | 122                                                                                 | 223                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 0                                                                                   | 9                                                                                   | 0                                                                                   | 0                                                                                   | 93                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 262                                                                               | 441                                                                               | 0                                                                                 | 22                                                                                | 371                                                                               | 0                                                                                 | 77                                                                                  | 55                                                                                  | 0                                                                                   | 15                                                                                  | 252                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 9                                                                                 |                                                                                   | 23                                                                                | 23                                                                                |                                                                                   | 9                                                                                 | 7                                                                                   |                                                                                     | 19                                                                                  | 19                                                                                  |                                                                                     | 7                                                                                   |
| Turn Type                         | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                              | NA                                                                                |                                                                                   | Perm                                                                                | NA                                                                                  |                                                                                     | Perm                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |
| Permitted Phases                  | 6                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 8                                                                                   |                                                                                     |                                                                                     | 4                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 59.5                                                                              | 59.5                                                                              |                                                                                   | 59.5                                                                              | 59.5                                                                              |                                                                                   | 20.5                                                                                | 20.5                                                                                |                                                                                     | 20.5                                                                                | 20.5                                                                                |                                                                                     |
| Effective Green, g (s)            | 59.5                                                                              | 59.5                                                                              |                                                                                   | 59.5                                                                              | 59.5                                                                              |                                                                                   | 20.5                                                                                | 20.5                                                                                |                                                                                     | 20.5                                                                                | 20.5                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.66                                                                              | 0.66                                                                              |                                                                                   | 0.66                                                                              | 0.66                                                                              |                                                                                   | 0.23                                                                                | 0.23                                                                                |                                                                                     | 0.23                                                                                | 0.23                                                                                |                                                                                     |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                                 | 5.0                                                                                 |                                                                                     | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 562                                                                               | 1033                                                                              |                                                                                   | 493                                                                               | 1095                                                                              |                                                                                   | 92                                                                                  | 366                                                                                 |                                                                                     | 262                                                                                 | 337                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | 0.28                                                                              |                                                                                   |                                                                                   | 0.22                                                                              |                                                                                   |                                                                                     | 0.03                                                                                |                                                                                     |                                                                                     | 0.17                                                                                |                                                                                     |
| v/s Ratio Perm                    | c0.31                                                                             |                                                                                   |                                                                                   | 0.03                                                                              |                                                                                   |                                                                                   | c0.19                                                                               |                                                                                     |                                                                                     | 0.01                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.47                                                                              | 0.43                                                                              |                                                                                   | 0.04                                                                              | 0.34                                                                              |                                                                                   | 0.84                                                                                | 0.15                                                                                |                                                                                     | 0.06                                                                                | 0.75                                                                                |                                                                                     |
| Uniform Delay, d1                 | 7.5                                                                               | 7.2                                                                               |                                                                                   | 5.3                                                                               | 6.7                                                                               |                                                                                   | 33.2                                                                                | 27.8                                                                                |                                                                                     | 27.2                                                                                | 32.4                                                                                |                                                                                     |
| Progression Factor                | 0.90                                                                              | 0.88                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.84                                                                                | 0.78                                                                                |                                                                                     |
| Incremental Delay, d2             | 2.1                                                                               | 1.0                                                                               |                                                                                   | 0.2                                                                               | 0.8                                                                               |                                                                                   | 45.2                                                                                | 0.2                                                                                 |                                                                                     | 0.1                                                                                 | 8.4                                                                                 |                                                                                     |
| Delay (s)                         | 8.9                                                                               | 7.3                                                                               |                                                                                   | 5.5                                                                               | 7.5                                                                               |                                                                                   | 78.4                                                                                | 28.0                                                                                |                                                                                     | 22.9                                                                                | 33.7                                                                                |                                                                                     |
| Level of Service                  | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 | A                                                                                 |                                                                                   | E                                                                                   | C                                                                                   |                                                                                     | C                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 7.9                                                                               |                                                                                   |                                                                                   | 7.4                                                                               |                                                                                   |                                                                                     | 55.5                                                                                |                                                                                     |                                                                                     | 33.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | E                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 17.6                                                                              |                                                                                   |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                           |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.56                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                                |                                                                                     |                                                                                     | 10.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 77.1%                                                                             |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                                |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

## HCM Signalized Intersection Capacity Analysis

## 6: Maryland Ave &amp; Fleet St

04/14/2023

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |  |                                                                                   |  |                                                                                   |  |  |  |  |                                                                                     |
| Traffic Volume (vph)              | 12                                                                                | 4                                                                                 | 2                                                                                 | 302                                                                               | 0                                                                                 | 145                                                                               | 0                                                                                 | 332                                                                                 | 415                                                                                 | 21                                                                                  | 308                                                                                 | 0                                                                                   |
| Future Volume (vph)               | 12                                                                                | 4                                                                                 | 2                                                                                 | 302                                                                               | 0                                                                                 | 145                                                                               | 0                                                                                 | 332                                                                                 | 415                                                                                 | 21                                                                                  | 308                                                                                 | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 0.99                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.97                                                                              |                                                                                   | 1.00                                                                                | 0.96                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.98                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 0.85                                                                              |                                                                                   | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 1579                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1376                                                                              |                                                                                   | 1676                                                                                | 1363                                                                                | 1593                                                                                | 1676                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 0.97                                                                              |                                                                                   | 0.95                                                                              |                                                                                   | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 0.18                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 1579                                                                              |                                                                                   | 1593                                                                              |                                                                                   | 1376                                                                              |                                                                                   | 1676                                                                                | 1363                                                                                | 301                                                                                 | 1676                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                |
| Adj. Flow (vph)                   | 17                                                                                | 6                                                                                 | 3                                                                                 | 425                                                                               | 0                                                                                 | 204                                                                               | 0                                                                                 | 468                                                                                 | 585                                                                                 | 30                                                                                  | 434                                                                                 | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 3                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 139                                                                               | 0                                                                                 | 0                                                                                   | 469                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 23                                                                                | 0                                                                                 | 425                                                                               | 0                                                                                 | 65                                                                                | 0                                                                                 | 468                                                                                 | 116                                                                                 | 30                                                                                  | 434                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 5                                                                                 |                                                                                   | 5                                                                                 | 5                                                                                 |                                                                                   | 5                                                                                 | 5                                                                                 |                                                                                     | 8                                                                                   | 8                                                                                   |                                                                                     | 5                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                |                                                                                   | Prot                                                                              |                                                                                   | Perm                                                                              |                                                                                   | NA                                                                                  | Perm                                                                                | pm+pt                                                                               | NA                                                                                  |                                                                                     |
| Protected Phases                  | 3                                                                                 | 3                                                                                 |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   |                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 4                                                                                 |                                                                                   |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 2.6                                                                               |                                                                                   | 28.8                                                                              |                                                                                   | 28.8                                                                              |                                                                                   | 17.8                                                                                | 17.8                                                                                | 45.1                                                                                | 45.1                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 2.6                                                                               |                                                                                   | 28.8                                                                              |                                                                                   | 28.8                                                                              |                                                                                   | 17.8                                                                                | 17.8                                                                                | 45.1                                                                                | 45.1                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.03                                                                              |                                                                                   | 0.32                                                                              |                                                                                   | 0.32                                                                              |                                                                                   | 0.20                                                                                | 0.20                                                                                | 0.50                                                                                | 0.50                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 | 4.5                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 4.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 2.0                                                                               |                                                                                   | 5.0                                                                                 | 5.0                                                                                 | 3.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 45                                                                                |                                                                                   | 509                                                                               |                                                                                   | 440                                                                               |                                                                                   | 331                                                                                 | 269                                                                                 | 478                                                                                 | 839                                                                                 |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.01                                                                             |                                                                                   | c0.27                                                                             |                                                                                   |                                                                                   |                                                                                   | c0.28                                                                               |                                                                                     | 0.02                                                                                | c0.26                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.05                                                                              |                                                                                   |                                                                                     | 0.08                                                                                | 0.02                                                                                |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.51                                                                              |                                                                                   | 0.83                                                                              |                                                                                   | 0.15                                                                              |                                                                                   | 1.41                                                                                | 0.43                                                                                | 0.06                                                                                | 0.52                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 43.1                                                                              |                                                                                   | 28.4                                                                              |                                                                                   | 21.8                                                                              |                                                                                   | 36.1                                                                                | 31.7                                                                                | 13.3                                                                                | 15.1                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 1.00                                                                              |                                                                                   | 1.19                                                                              |                                                                                   | 3.79                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 12.5                                                                              |                                                                                   | 10.1                                                                              |                                                                                   | 0.1                                                                               |                                                                                   | 203.3                                                                               | 5.0                                                                                 | 0.3                                                                                 | 2.3                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 55.6                                                                              |                                                                                   | 43.9                                                                              |                                                                                   | 82.9                                                                              |                                                                                   | 239.4                                                                               | 36.6                                                                                | 13.6                                                                                | 17.4                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 |                                                                                   | F                                                                                 |                                                                                   | F                                                                                   | D                                                                                   | B                                                                                   | B                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 55.6                                                                              |                                                                                   |                                                                                   | 56.6                                                                              |                                                                                   |                                                                                   | 126.7                                                                               |                                                                                     |                                                                                     | 17.1                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | F                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 82.1                                                                              |                                                                                   |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                     |                                                                                     | F                                                                                   |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.88                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                     |                                                                                     | 18.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 51.8%                                                                             |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## ATTACHMENT A

HCM Signalized Intersection Capacity Analysis  
7: MD 355 & E Jefferson St

04/14/2023

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |  |                                                                                   |                                                                                   |  |  |  |  |                                                                                     |  |  |  |
| Traffic Volume (vph)              | 0                                                                                 | 591                                                                               | 238                                                                               | 0                                                                                 | 443                                                                               | 378                                                                               | 267                                                                                | 1003                                                                                | 0                                                                                   | 535                                                                                 | 847                                                                                 | 61                                                                                  |
| Future Volume (vph)               | 0                                                                                 | 591                                                                               | 238                                                                               | 0                                                                                 | 443                                                                               | 378                                                                               | 267                                                                                | 1003                                                                                | 0                                                                                   | 535                                                                                 | 847                                                                                 | 61                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.95                                                                              | 1.00                                                                              | 0.97                                                                               | 0.91                                                                                |                                                                                     | 0.97                                                                                | 0.91                                                                                |                                                                                     |
| Frpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb, ped/bikes                   |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Frt                               |                                                                                   | 0.96                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.99                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   | 3048                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4523                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   | 3048                                                                              |                                                                                   |                                                                                   | 3185                                                                              | 1425                                                                              | 3090                                                                               | 4577                                                                                |                                                                                     | 3090                                                                                | 4523                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                               | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 603                                                                               | 243                                                                               | 0                                                                                 | 452                                                                               | 386                                                                               | 272                                                                                | 1023                                                                                | 0                                                                                   | 546                                                                                 | 864                                                                                 | 62                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                 | 24                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 244                                                                               | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 4                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 822                                                                               | 0                                                                                 | 0                                                                                 | 452                                                                               | 142                                                                               | 272                                                                                | 1023                                                                                | 0                                                                                   | 546                                                                                 | 922                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 5                                                                                   |
| Turn Type                         |                                                                                   | NA                                                                                |                                                                                   |                                                                                   | NA                                                                                | Perm                                                                              | Prot                                                                               | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases                  |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 1                                                                                  | 5                                                                                   |                                                                                     | 6                                                                                   | 2                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   | 51.0                                                                              |                                                                                   |                                                                                   | 51.0                                                                              | 51.0                                                                              | 25.0                                                                               | 76.0                                                                                |                                                                                     | 27.0                                                                                | 78.0                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   | 51.0                                                                              |                                                                                   |                                                                                   | 51.0                                                                              | 51.0                                                                              | 25.0                                                                               | 76.0                                                                                |                                                                                     | 27.0                                                                                | 78.0                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   | 0.28                                                                              |                                                                                   |                                                                                   | 0.28                                                                              | 0.28                                                                              | 0.14                                                                               | 0.42                                                                                |                                                                                     | 0.15                                                                                | 0.43                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   | 9.0                                                                               |                                                                                   |                                                                                   | 9.0                                                                               | 9.0                                                                               | 8.0                                                                                | 8.0                                                                                 |                                                                                     | 9.0                                                                                 | 9.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 7.0                                                                                | 0.2                                                                                 |                                                                                     | 5.0                                                                                 | 0.2                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   | 863                                                                               |                                                                                   |                                                                                   | 902                                                                               | 403                                                                               | 429                                                                                | 1932                                                                                |                                                                                     | 463                                                                                 | 1959                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   | c0.27                                                                             |                                                                                   |                                                                                   | 0.14                                                                              |                                                                                   | 0.09                                                                               | c0.22                                                                               |                                                                                     | c0.18                                                                               | 0.20                                                                                |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.10                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   | 0.95                                                                              |                                                                                   |                                                                                   | 0.50                                                                              | 0.35                                                                              | 0.63                                                                               | 0.53                                                                                |                                                                                     | 1.18                                                                                | 0.47                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   | 63.3                                                                              |                                                                                   |                                                                                   | 53.9                                                                              | 51.4                                                                              | 73.2                                                                               | 38.7                                                                                |                                                                                     | 76.5                                                                                | 36.3                                                                                |                                                                                     |
| Progression Factor                |                                                                                   | 0.84                                                                              |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   | 17.6                                                                              |                                                                                   |                                                                                   | 2.0                                                                               | 2.4                                                                               | 5.9                                                                                | 1.0                                                                                 |                                                                                     | 101.1                                                                               | 0.8                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   | 71.0                                                                              |                                                                                   |                                                                                   | 55.9                                                                              | 53.8                                                                              | 79.0                                                                               | 39.7                                                                                |                                                                                     | 177.6                                                                               | 37.1                                                                                |                                                                                     |
| Level of Service                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | D                                                                                 | E                                                                                  | D                                                                                   |                                                                                     | F                                                                                   | D                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 71.0                                                                              |                                                                                   |                                                                                   | 54.9                                                                              |                                                                                   |                                                                                    | 48.0                                                                                |                                                                                     |                                                                                     | 89.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | F                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   | 67.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio |                                                                                   | 0.78                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 180.0                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     | 26.0                                                                                |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 86.8%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 1: Monroe St &amp; E Middle Ln

| Movement              | EB  | EB  | WB  | WB  | NB |
|-----------------------|-----|-----|-----|-----|----|
| Directions Served     | T   | TR  | T   | T   | R  |
| Maximum Queue (ft)    | 23  | 12  | 37  | 18  | 40 |
| Average Queue (ft)    | 1   | 0   | 4   | 1   | 22 |
| 95th Queue (ft)       | 12  | 6   | 24  | 9   | 46 |
| Link Distance (ft)    | 640 | 640 | 187 | 187 |    |
| Upstream Blk Time (%) |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |
| Storage Bay Dist (ft) |     |     |     |     |    |
| Storage Blk Time (%)  |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |

## Intersection: 2: Monroe St &amp; E Montgomery Ave

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Intersection: 3: Monroe St &amp; Monroe Pl

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |



## ATTACHMENT A

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 4: Monroe St &amp; E Jefferson St

| Movement              | EB  | EB  | EB  | WB  | WB  | WB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | T   | TR  | L   | T   | TR  | T   | R   | L   | TR  |
| Maximum Queue (ft)    | 88  | 222 | 276 | 150 | 375 | 386 | 136 | 108 | 73  | 162 |
| Average Queue (ft)    | 36  | 104 | 139 | 69  | 177 | 199 | 59  | 39  | 14  | 80  |
| 95th Queue (ft)       | 69  | 181 | 240 | 148 | 335 | 350 | 111 | 80  | 47  | 135 |
| Link Distance (ft)    |     | 546 | 546 |     | 883 | 883 |     | 432 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 250 |     |     | 125 |     |     | 225 |     | 150 |     |
| Storage Blk Time (%)  |     | 0   |     | 0   | 13  |     |     |     |     | 0   |
| Queuing Penalty (veh) |     | 0   |     | 1   | 12  |     |     |     |     | 0   |

## Intersection: 5: Monroe St &amp; Fleet St

| Movement              | EB  | EB  | WB  | WB  | NB | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|----|-----|-----|-----|
| Directions Served     | L   | TR  | L   | TR  | L  | TR  | L   | TR  |
| Maximum Queue (ft)    | 124 | 246 | 29  | 196 | 74 | 144 | 68  | 125 |
| Average Queue (ft)    | 59  | 95  | 6   | 87  | 46 | 46  | 26  | 54  |
| 95th Queue (ft)       | 108 | 192 | 24  | 164 | 78 | 107 | 60  | 101 |
| Link Distance (ft)    |     | 361 | 580 | 580 |    | 528 |     | 432 |
| Upstream Blk Time (%) |     | 0   |     |     |    |     |     |     |
| Queuing Penalty (veh) |     | 0   |     |     |    |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |     | 50 |     | 175 |     |
| Storage Blk Time (%)  | 1   | 4   |     |     | 21 | 8   |     |     |
| Queuing Penalty (veh) | 5   | 7   |     |     | 12 | 6   |     |     |

## Intersection: 6: Maryland Ave &amp; Fleet St

| Movement              | EB  | WB  | WB  | NB  | NB  | SB | SB  |
|-----------------------|-----|-----|-----|-----|-----|----|-----|
| Directions Served     | LTR | L   | R   | T   | R   | L  | T   |
| Maximum Queue (ft)    | 33  | 246 | 297 | 223 | 123 | 77 | 118 |
| Average Queue (ft)    | 4   | 166 | 73  | 117 | 26  | 24 | 47  |
| 95th Queue (ft)       | 19  | 252 | 176 | 192 | 81  | 54 | 98  |
| Link Distance (ft)    | 141 |     | 361 | 646 |     |    | 432 |
| Upstream Blk Time (%) |     |     | 0   |     |     |    |     |
| Queuing Penalty (veh) |     |     | 0   |     |     |    |     |
| Storage Bay Dist (ft) |     | 225 |     | 450 | 125 |    |     |
| Storage Blk Time (%)  |     | 2   | 0   |     |     |    | 0   |
| Queuing Penalty (veh) |     | 4   | 0   |     |     |    | 0   |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | EB  | EB  | WB  | WB  | WB  | NB  | NB  | NB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | T   | TR  | T   | T   | R   | L   | L   | T   | T   | T   | L   | L   |
| Maximum Queue (ft)    | 264 | 314 | 379 | 354 | 33  | 128 | 184 | 250 | 230 | 183 | 223 | 259 |
| Average Queue (ft)    | 109 | 126 | 246 | 221 | 3   | 34  | 81  | 160 | 138 | 73  | 106 | 158 |
| 95th Queue (ft)       | 201 | 246 | 351 | 334 | 18  | 107 | 153 | 235 | 217 | 168 | 208 | 224 |
| Link Distance (ft)    | 883 | 883 | 941 | 941 | 941 |     |     | 760 | 760 | 760 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     | 275 | 275 |     |     |     | 425 | 425 |
| Storage Blk Time (%)  |     |     |     |     |     |     |     | 0   |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     | 0   |     |     |     |     |

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | T   | T   | TR  |
| Maximum Queue (ft)    | 382 | 365 | 300 |
| Average Queue (ft)    | 256 | 240 | 175 |
| 95th Queue (ft)       | 356 | 328 | 259 |
| Link Distance (ft)    | 658 | 658 | 658 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Network Summary

Network wide Queuing Penalty: 49

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 1: Monroe St &amp; E Middle Ln

| Movement              | EB  | EB  | WB  | WB  | NB |
|-----------------------|-----|-----|-----|-----|----|
| Directions Served     | T   | TR  | T   | T   | R  |
| Maximum Queue (ft)    | 39  | 12  | 40  | 18  | 55 |
| Average Queue (ft)    | 3   | 1   | 5   | 1   | 27 |
| 95th Queue (ft)       | 20  | 8   | 25  | 8   | 50 |
| Link Distance (ft)    | 640 | 640 | 187 | 187 |    |
| Upstream Blk Time (%) |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |
| Storage Bay Dist (ft) |     |     |     |     |    |
| Storage Blk Time (%)  |     |     |     |     |    |
| Queuing Penalty (veh) |     |     |     |     |    |

## Intersection: 2: Monroe St &amp; E Montgomery Ave

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Intersection: 3: Monroe St &amp; Monroe Pl

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 4: Monroe St &amp; E Jefferson St

| Movement              | EB  | EB  | EB  | WB  | WB  | WB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | T   | TR  | L   | T   | TR  | T   | R   | L   | TR  |
| Maximum Queue (ft)    | 134 | 280 | 277 | 150 | 368 | 371 | 104 | 169 | 142 | 225 |
| Average Queue (ft)    | 29  | 160 | 149 | 58  | 216 | 236 | 44  | 76  | 51  | 120 |
| 95th Queue (ft)       | 80  | 245 | 240 | 145 | 322 | 335 | 96  | 142 | 105 | 201 |
| Link Distance (ft)    |     | 546 | 546 |     | 883 | 883 |     | 432 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 250 |     |     | 125 |     |     | 225 |     | 150 |     |
| Storage Blk Time (%)  |     | 1   |     | 0   | 16  |     |     |     |     | 6   |
| Queuing Penalty (veh) |     | 0   |     | 0   | 8   |     |     |     |     | 4   |

## Intersection: 5: Monroe St &amp; Fleet St

| Movement              | EB  | EB  | WB  | WB  | NB | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|----|-----|-----|-----|
| Directions Served     | L   | TR  | L   | TR  | L  | TR  | L   | TR  |
| Maximum Queue (ft)    | 121 | 203 | 42  | 150 | 71 | 83  | 67  | 230 |
| Average Queue (ft)    | 55  | 60  | 6   | 49  | 35 | 28  | 6   | 78  |
| 95th Queue (ft)       | 105 | 130 | 27  | 111 | 67 | 68  | 37  | 158 |
| Link Distance (ft)    |     | 361 | 580 | 580 |    | 528 |     | 432 |
| Upstream Blk Time (%) |     |     |     |     |    |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |    |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |     | 50 |     | 175 |     |
| Storage Blk Time (%)  | 1   | 1   |     |     | 10 | 6   |     | 1   |
| Queuing Penalty (veh) | 4   | 2   |     |     | 4  | 3   |     | 0   |

## Intersection: 6: Maryland Ave &amp; Fleet St

| Movement              | EB  | WB  | WB  | NB  | NB  | SB | SB  |
|-----------------------|-----|-----|-----|-----|-----|----|-----|
| Directions Served     | LTR | L   | R   | T   | R   | L  | T   |
| Maximum Queue (ft)    | 56  | 248 | 278 | 353 | 68  | 59 | 184 |
| Average Queue (ft)    | 15  | 171 | 71  | 186 | 10  | 11 | 71  |
| 95th Queue (ft)       | 42  | 257 | 181 | 303 | 42  | 40 | 146 |
| Link Distance (ft)    | 141 |     | 361 | 646 |     |    | 432 |
| Upstream Blk Time (%) |     |     | 0   |     |     |    |     |
| Queuing Penalty (veh) |     |     | 0   |     |     |    |     |
| Storage Bay Dist (ft) |     | 225 |     | 450 | 125 |    |     |
| Storage Blk Time (%)  |     | 3   |     |     |     |    | 2   |
| Queuing Penalty (veh) |     | 5   |     |     |     |    | 0   |

Queuing and Blocking Report  
Build Conditions

04/14/2023

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | EB  | EB  | WB  | WB  | WB  | NB  | NB  | NB  | NB  | NB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | T   | TR  | T   | T   | R   | L   | L   | T   | T   | T   | L   | L   |
| Maximum Queue (ft)    | 525 | 568 | 299 | 281 | 150 | 198 | 300 | 449 | 378 | 286 | 437 | 450 |
| Average Queue (ft)    | 280 | 325 | 164 | 138 | 22  | 89  | 164 | 262 | 236 | 174 | 426 | 444 |
| 95th Queue (ft)       | 454 | 504 | 261 | 236 | 89  | 185 | 289 | 399 | 345 | 277 | 475 | 475 |
| Link Distance (ft)    | 883 | 883 | 941 | 941 | 941 |     |     | 760 | 760 | 760 |     |     |
| Upstream Blk Time (%) |     |     |     |     |     |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |     |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     | 275 | 275 |     |     |     | 425 | 425 |
| Storage Blk Time (%)  |     |     |     |     |     | 0   | 0   | 6   |     |     | 10  | 67  |
| Queuing Penalty (veh) |     |     |     |     |     | 0   | 0   | 15  |     |     | 28  | 190 |

## Intersection: 7: MD 355 &amp; E Jefferson St

| Movement              | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | T   | T   | TR  |
| Maximum Queue (ft)    | 704 | 652 | 452 |
| Average Queue (ft)    | 628 | 422 | 256 |
| 95th Queue (ft)       | 858 | 706 | 414 |
| Link Distance (ft)    | 658 | 658 | 658 |
| Upstream Blk Time (%) | 68  | 0   |     |
| Queuing Penalty (veh) | 0   | 0   |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  | 1   |     |     |
| Queuing Penalty (veh) | 5   |     |     |

## Network Summary

Network wide Queuing Penalty: 268

ATTACHMENT A

Fleet and Monroe Streets, Complete Streets Study  
APPENDICES



## **Appendix C: Conceptual Plans**





MATCHLINE SEE DWG. NO. 2

Diagram illustrating the cross-section of a four-lane divided highway. The total width is 65 feet, divided into a 65-foot right-of-way and a 45-foot right-of-way. The 65-foot right-of-way includes a 7-foot sidewalk, two 11-foot travel lanes, and a 44-foot curb-to-curb section. The 45-foot right-of-way includes a 5-foot sidewalk and two 11-foot travel lanes. Arrows indicate traffic flow: left lanes are for through traffic, and right lanes are for through traffic. A pedestrian is shown on the 7-foot sidewalk, and a bicyclist is shown on the 5-foot sidewalk.

Diagram illustrating a 33' curb-to-curb street cross-section layout:

- 3' GRASS BUFFER**
- 7' SIDEWALK**
- 8' SHARED USE PATH**
- 11' EASTBOUND TRAVEL LANE**
- 11' WESTBOUND TRAVEL LANE**
- 11' WESTBOUND TRAVEL LANE**
- 5' SIDE-WALK**

Overall dimensions and labels:

- 19'-27'** (Total width from Right-of-Way to end of Shared Use Path)
- 33' CURB-TO-CURB** (Total width of the street)
- 4.5' - 10'** (Width of the Side-Walk)
- RIGHT-OF-WAY** (Left boundary line)
- TRUCK C-TRAIL** (Right boundary line)



DESIGNED B. WHITE  
DRAFTED C. KELLER  
CHECKED B. WHITE

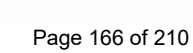
DIRECTOR OF PUBLIC WORKS                      APPROVAL DA

CHIEF, CONSTRUCTION MANAGEMENT APPROVAL DATE

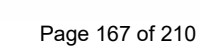
Election District No.2                      City of Rockville, Maryland

|       |        |
|-------|--------|
| SHEET | FILE # |
| NO. 1 |        |
| OF 5  |        |

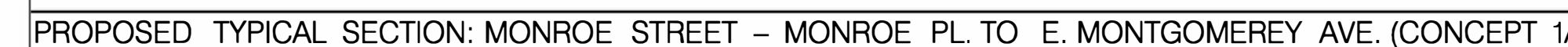






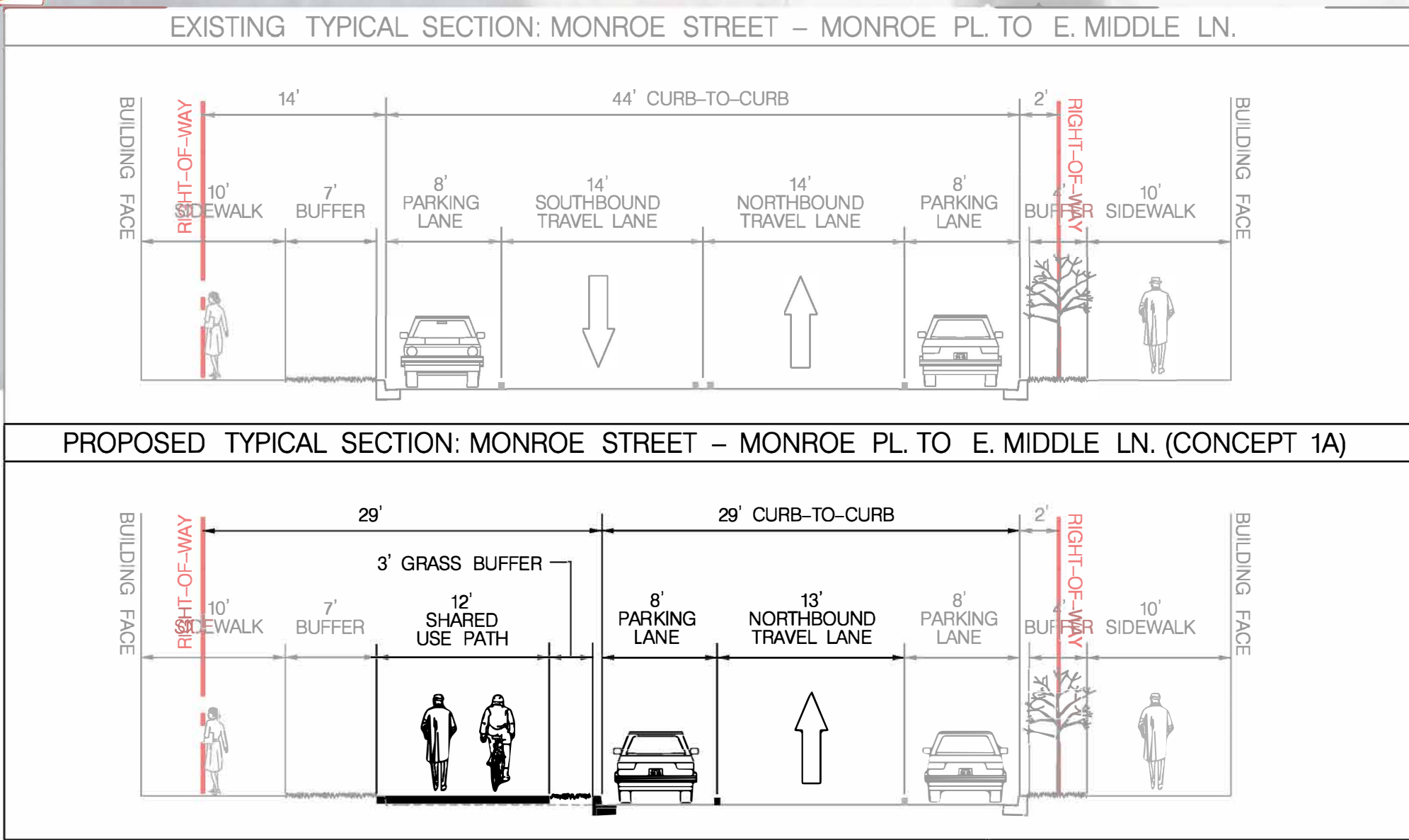
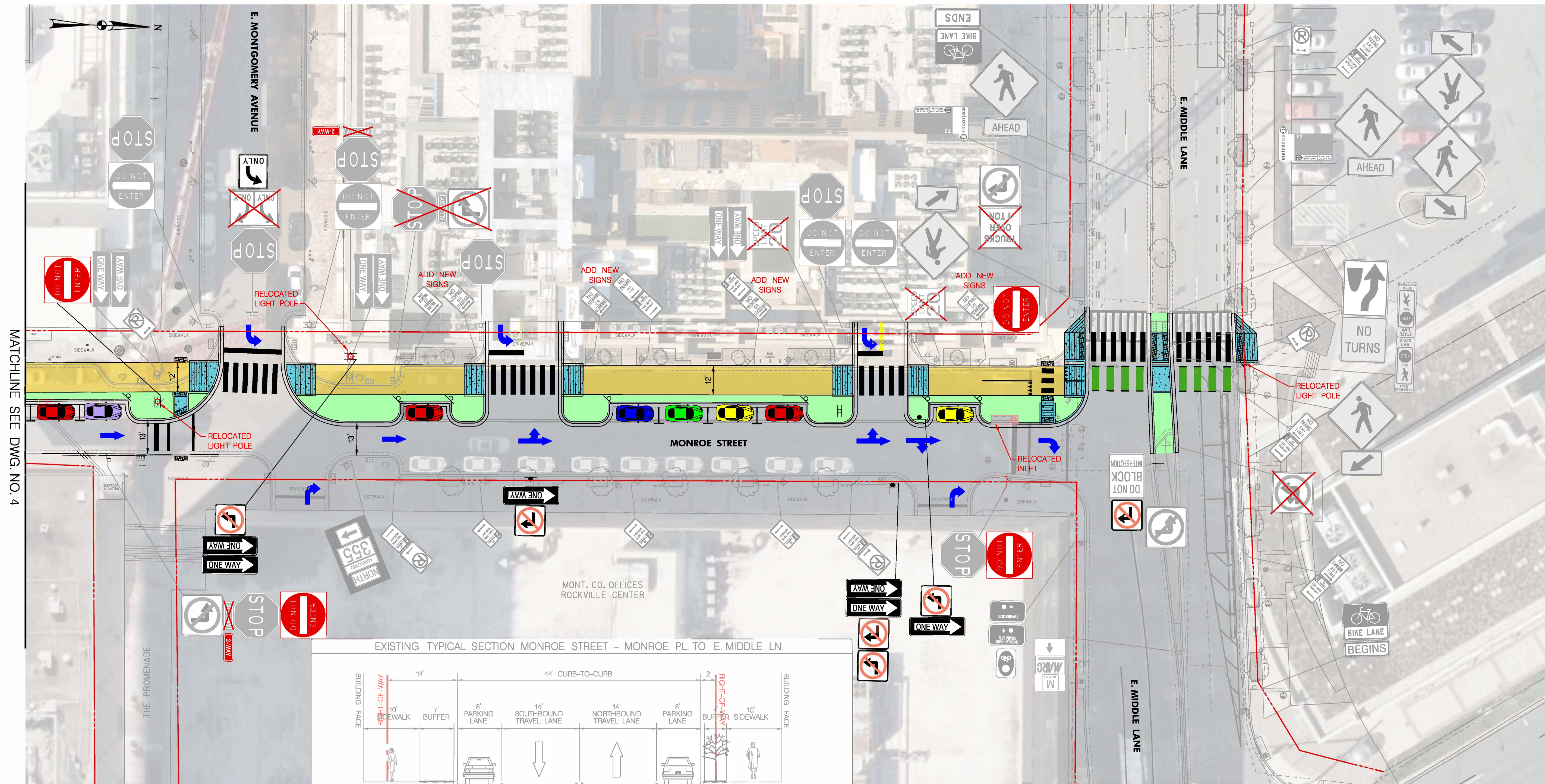




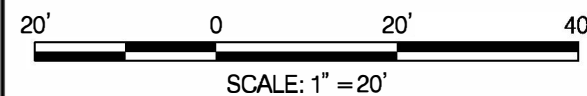


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|--------|--------------|--------|
| SCALE  | SHEET        | FILE # |
| 1"=20' | NO. <u>4</u> |        |
|        | OF <u>5</u>  |        |





**Mead & Hunt**  
7055 SAMUEL MORSE DRIVE  
SUITE 100  
COLUMBIA, MD 21046  
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WWW.MEADHUNT.COM



DEPARTMENT OF PUBLIC WORKS  
CITY OF  
**ROCKVILLE**  
111 MARYLAND AVE. ROCKVILLE, MARYLAND

DESIGNED B. WHITE  
DRAFTED C. KELLER  
CHECKED B. WHITE

DESIGN PLAN APPROVAL

|                          |                     |                   |
|--------------------------|---------------------|-------------------|
|                          | PKW# _____          | SCP# _____        |
|                          | SMP# _____          | REVIEWED BY _____ |
| DIRECTOR OF PUBLIC WORKS | APPROVAL DATE _____ |                   |

AS BUILT PLAN APPROVAL

|                                |                     |
|--------------------------------|---------------------|
|                                | APPROVAL DATE _____ |
| CHIEF, CONSTRUCTION MANAGEMENT |                     |

CONCEPT 1

MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET  
COMPLETE STREETS STUDY

Election District No. 2 City of Rockville, Maryland

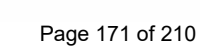
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|---------------------------------------------------|----------------|--------|-----|------|
| APPROVAL OF REVISIONS AFTER INITIAL PLAN APPROVAL |                |        |     |      |
| DATE SUBMITTED<br>OCTOBER 2022                    |                |        |     |      |
| SCALE<br>1"=20'                                   | SHEET<br>NO. 5 | FILE # |     |      |
|                                                   | OF 5           |        |     |      |





|       |        |
|-------|--------|
| SHEET | FILE # |
| NO. 1 |        |
| OF 5  |        |

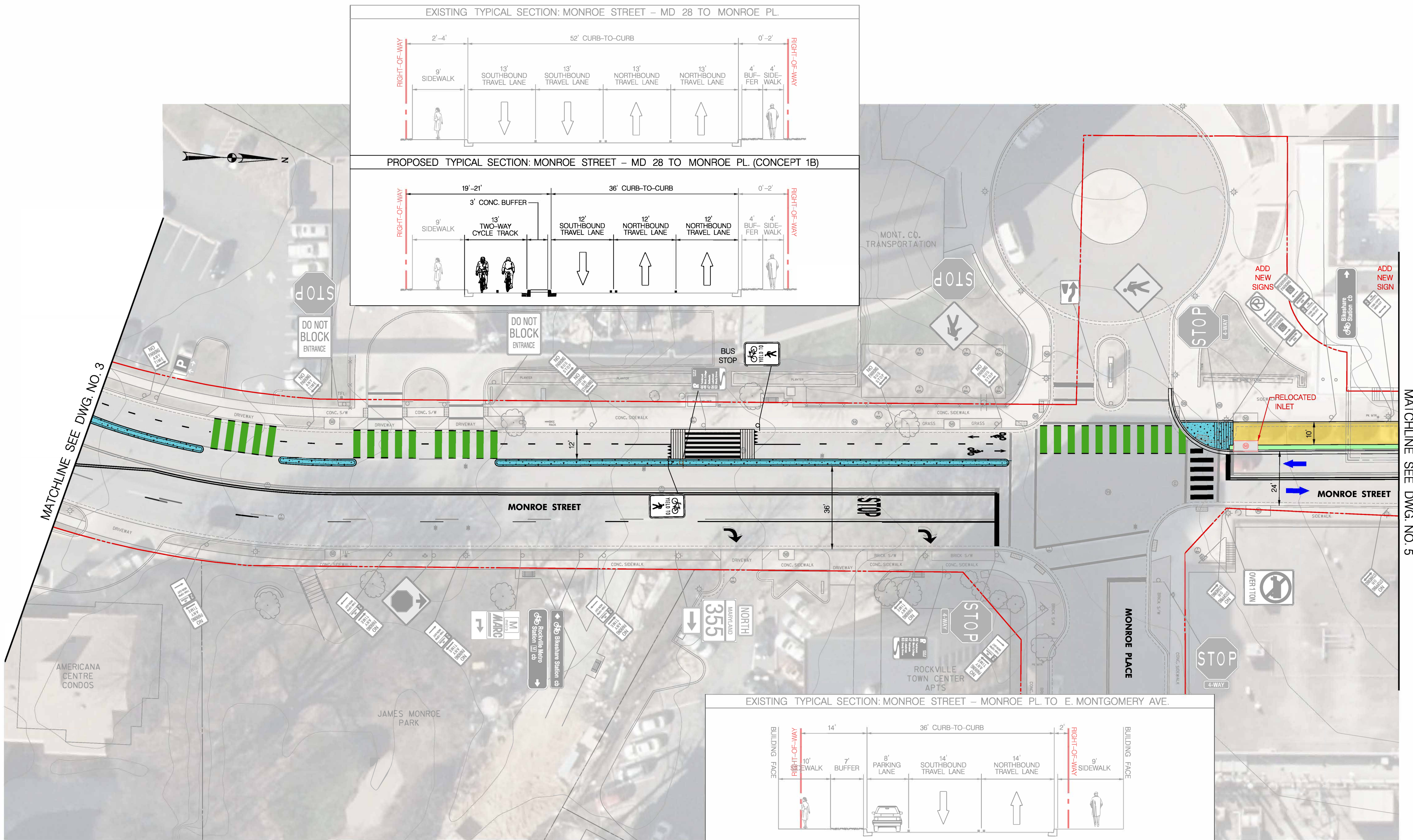






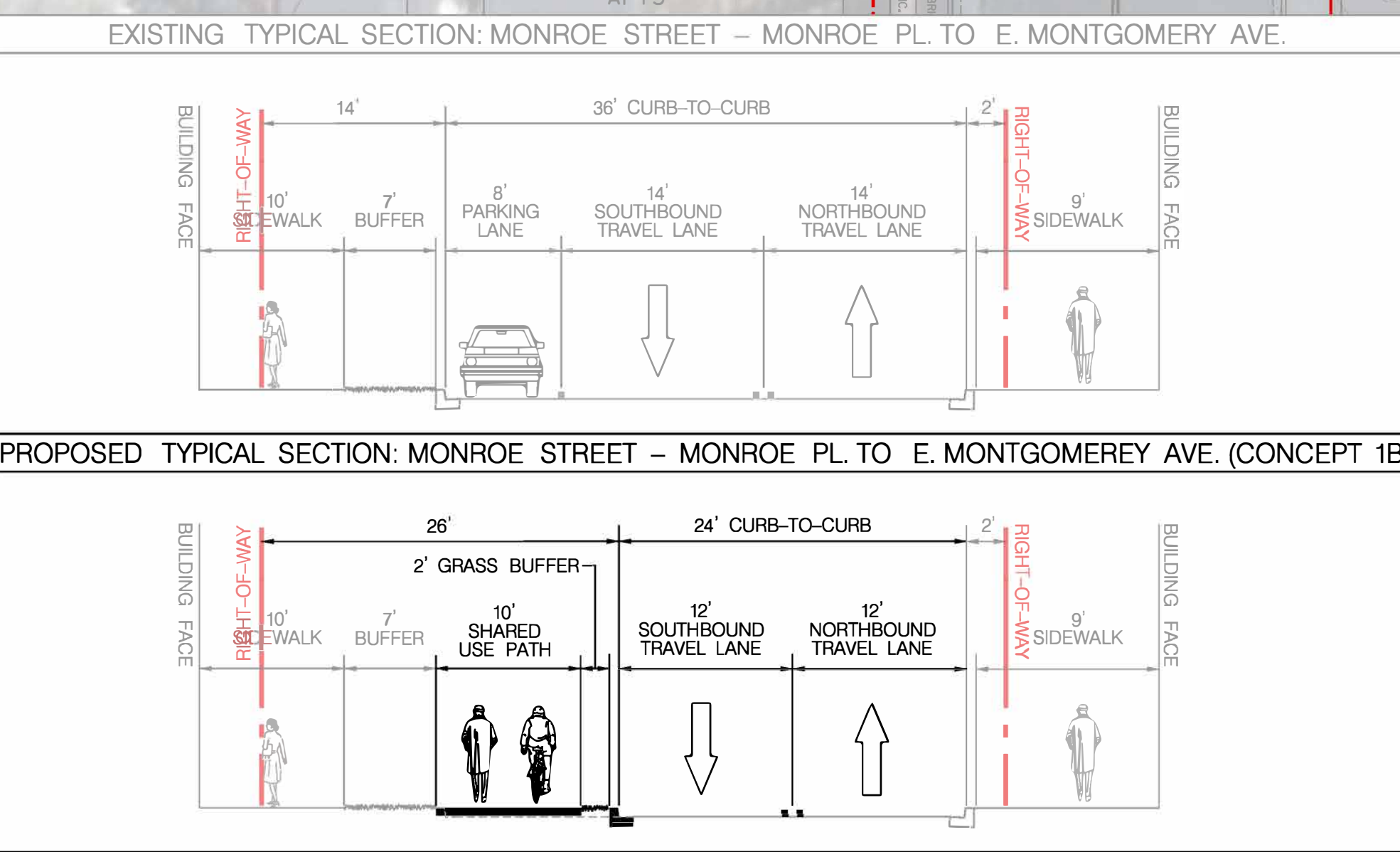
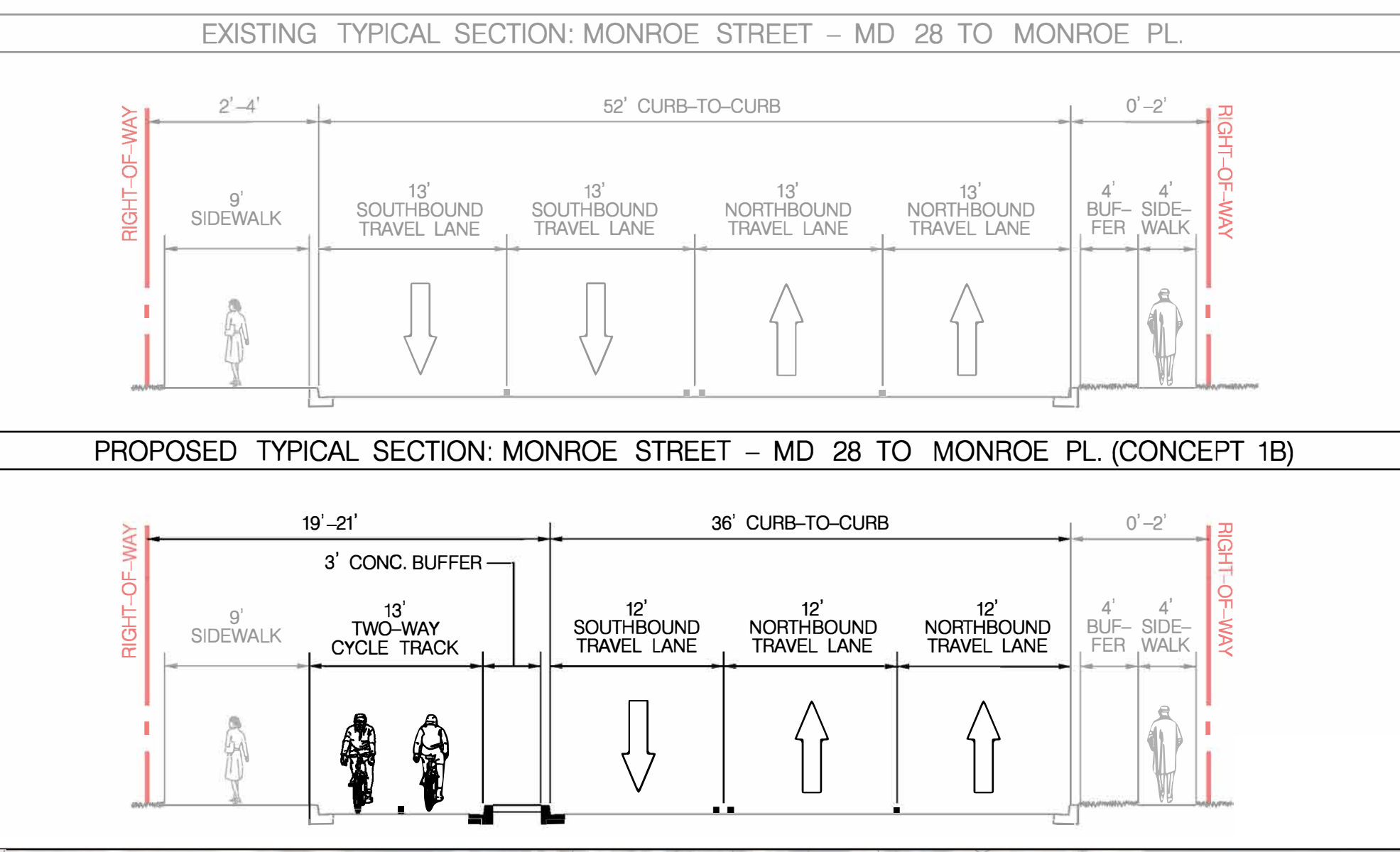




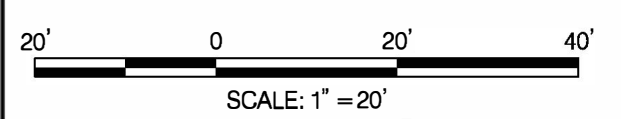


MATCHLINE SEE DWG. NO. 3

MATCHLINE SEE DWG. NO. 5

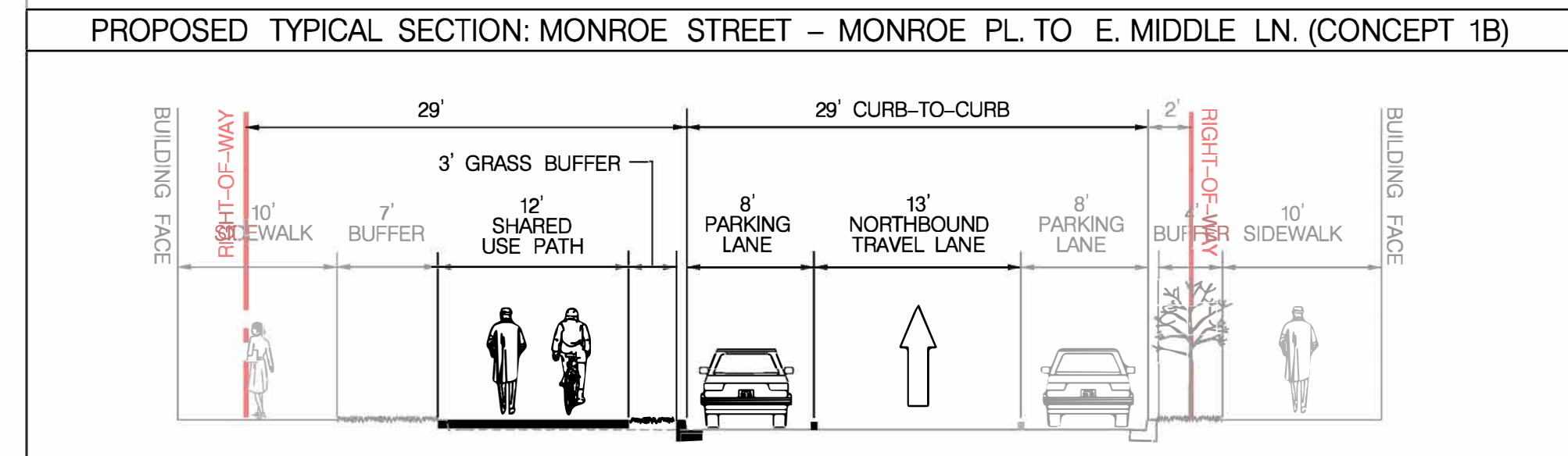


**Mead & Hunt**  
7055 SAMUEL MORSE DRIVE  
SUITE 100  
COLUMBIA, MD 21046  
(443) 741-3500 PHONE  
WWW.MEADHUNT.COM



|  |                                                                                                    |                          |                              |                                |                        |                                |           |                                                                                                                                        |                                                   |                                      |        |  |
|--|----------------------------------------------------------------------------------------------------|--------------------------|------------------------------|--------------------------------|------------------------|--------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------|--------|--|
|  | DEPARTMENT OF PUBLIC WORKS<br>CITY OF<br><b>ROCKVILLE</b><br>111 MARYLAND AVE. ROCKVILLE, MARYLAND | DESIGNED <u>B. WHITE</u> | DESIGN PLAN APPROVAL         |                                | AS BUILT PLAN APPROVAL |                                | CONCEPT 2 | MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET<br>COMPLETE STREETS STUDY<br><br>Election District No. 2 City of Rockville, Maryland | APPROVAL OF REVISIONS AFTER INITIAL PLAN APPROVAL |                                      |        |  |
|  |                                                                                                    | DRAFTED <u>C. KELLER</u> | PKW# _____ SCP# _____        | CHIEF, CONSTRUCTION MANAGEMENT | APPROVAL DATE _____    | DATE SUBMITTED<br>OCTOBER 2022 |           |                                                                                                                                        | SCALE<br>1"=20'                                   | SHEET<br>NO. <u>4</u><br>OF <u>5</u> | FILE # |  |
|  |                                                                                                    | CHECKED <u>B. WHITE</u>  | SMP# _____ REVIEWED BY _____ |                                |                        |                                |           |                                                                                                                                        |                                                   |                                      |        |  |



[illegible]





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| DESCRIPTION OF REVISION                                  | P.E. INITIAL | DATE | DPW | DATE |
|----------------------------------------------------------|--------------|------|-----|------|
| <b>APPROVAL OF REVISIONS AFTER INITIAL PLAN APPROVAL</b> |              |      |     |      |

|             |                                |                     |                           |        |
|-------------|--------------------------------|---------------------|---------------------------|--------|
| LEET STREET | DATE SUBMITTED<br>OCTOBER 2022 | SCALE<br><br>1"=20' | SHEET<br>NO. <u>  5  </u> | FILE # |
|             |                                |                     | OF <u>  5  </u>           |        |

ville, Maryland



ATTACHMENT A

Fleet and Monroe Streets, Complete Streets Study  
APPENDICES



## **Appendix D: Cost Breakdown**

ATTACHMENT A

|                                     |              |              | units     |            |             |
|-------------------------------------|--------------|--------------|-----------|------------|-------------|
| Construction Element                | Unit         | Unit Cost    | bike path | cycletrack | combination |
| 10' wide path with 4' grass buffer  | LF           | \$ 100.00    | 2350      | 530        | 1600        |
| Relocate Utility Pole or Light Pole | each         | \$ 10,000.00 | 2         | 2          | 2           |
| Relocate sign pole                  | each         | \$ 100.00    | 10        | 10         | 10          |
| Curb and Gutter                     | LF           | \$ 50.00     | 2500      | 600        | 1750        |
| Sidewalk Removal                    | SF           | \$ 5.00      | 0         | 0          | 0           |
| Pavement Removal                    | SF           | \$ 7.00      | 32000     | 7000       | 20000       |
| Prefab Concrete curb buffer         | LF           | \$ 65.00     | 0         | 1750       | 750         |
| Inlet Relocation                    | each         | \$ 25,000.00 | 8         | 2          | 6           |
| Driveway reconstruction             | each         | \$ 5,000.00  | 9         | 0          | 5           |
| Pedestrian Signals                  | each         | \$ 10,000.00 | 0         | 2          | 0           |
| <b>SUBTOTAL</b>                     |              |              |           |            |             |
| <b>MOT</b>                          | 10% of total |              |           |            |             |
| <b>Landscaping</b>                  | 5% of total  |              |           |            |             |
| <b>Mobilization</b>                 | 5% of total  |              |           |            |             |

| Planning Level Construction Cost |               |               |
|----------------------------------|---------------|---------------|
| bike path                        | cycletrack    | combination   |
| \$ 235,000.00                    | \$ 53,000.00  | \$ 160,000.00 |
| \$ 20,000.00                     | \$ 20,000.00  | \$ 20,000.00  |
| \$ 1,000.00                      | \$ 1,000.00   | \$ 1,000.00   |
| \$ 125,000.00                    | \$ 30,000.00  | \$ 87,500.00  |
| \$ -                             | \$ -          | \$ -          |
| \$ 224,000.00                    | \$ 49,000.00  | \$ 140,000.00 |
| \$ -                             | \$ 113,750.00 | \$ 48,750.00  |
| \$ 200,000.00                    | \$ 50,000.00  | \$ 150,000.00 |
| \$ 45,000.00                     | \$ -          | \$ 25,000.00  |
| \$ -                             | \$ 20,000.00  | \$ -          |
| \$ 850,000.00                    | \$ 336,750.00 | \$ 632,250.00 |
| \$ 85,000.00                     | \$ 33,675.00  | \$ 63,225.00  |
| \$ 42,500.00                     | \$ 16,837.50  | \$ 31,612.50  |
| \$ 42,500.00                     | \$ 16,837.50  | \$ 31,612.50  |

**Grand Total**

**\$ 1,020,000.00 \$ 404,100.00 \$ 758,700.00**

ATTACHMENT A

Fleet and Monroe Streets, Complete Streets Study  
APPENDICES



## **Appendix E: Public Presentation**



# Fleet and Monroe Streets

Complete Streets



May 4<sup>th</sup>, 2023

Mead  
& Hunt

# Introduction / Presentation Outline

Funding Source:  
MWCOG TLC  
grant

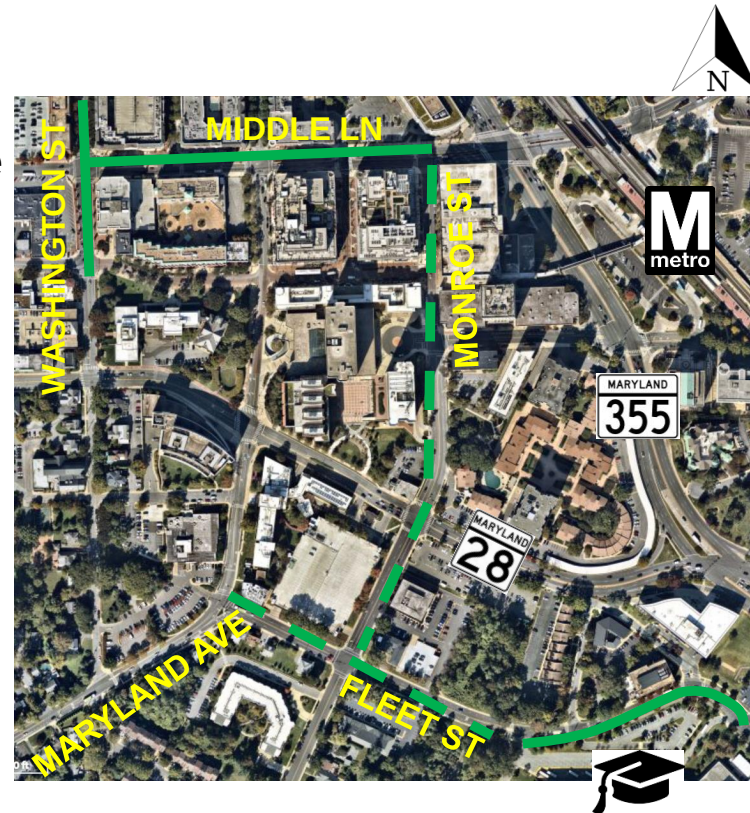
- Purpose & Need / Project Limits
- Constraints & Opportunities
- Concepts
- Impacts
- Next Steps
- Q&A



Get Into It

# Purpose & Need

- Expansion of biking & walking facilities from Town Center core
- Connecting Middle Lane Protected Bike Lanes to Fleet Street and to RMHS and Rockville Metro Station
- Providing *dedicated* walking and biking facilities, *separated* from vehicle traffic
  - Sidewalk and bike path
  - Wide shared use path
  - Sidewalk and protected cycletrack
- Goal: Buy-in on a concept
  - 1) Confirm general design concept
    - 1) Proof of concept (no fatal flaws, traffic congestion mitigated, etc.)
    - 2) Design assumptions addressed during next stage



Get Into It

# Constraints & Opportunities

- Constraints
  - Narrow Public Right-of-Way
  - Narrow travel lanes (11' to 12')
  - Curbside on-street parking in Town Center is desirable
- Opportunities
  - Select areas of extra roadway capacity → Opportunity for repurposing travel lanes
  - Grid network allows traffic diversions
  - Improved safety & connectivity will reduce vehicle demand for short trips

Result: Lane Removal on Fleet  
and on Monroe



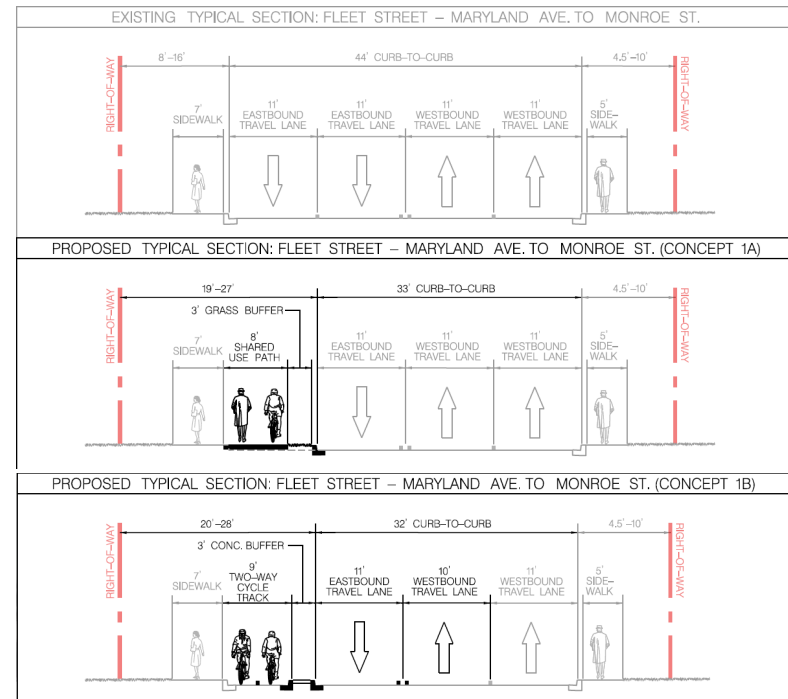
Get Into It





# General Discussion of Options

- Side path to replace travel lane
- 2-way cycletrack to replace travel lane
- Combination of each
  - Path on Monroe St
    - driveway conflicts
    - increased activity density
  - Cycletrack on Fleet St



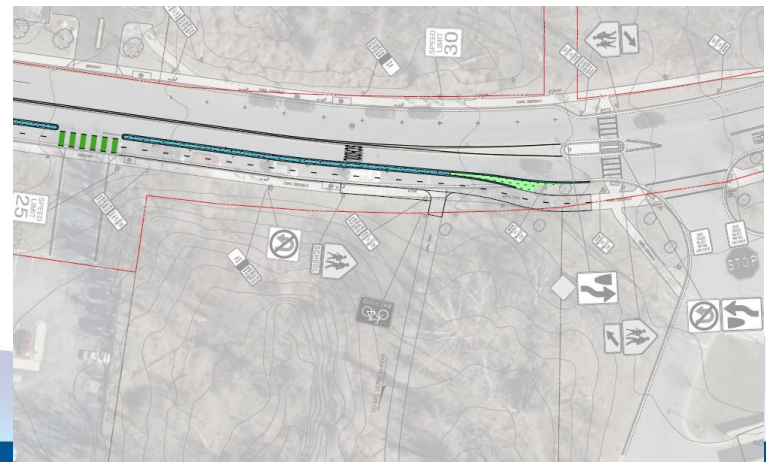
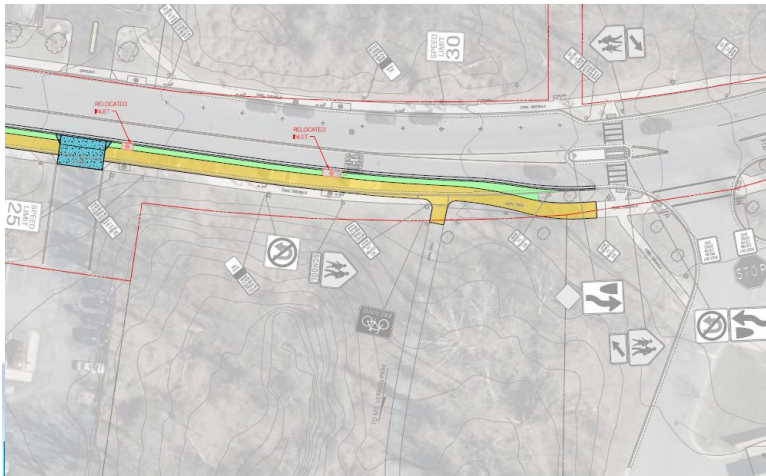
Curbside bike lanes on each side of road was dismissed. Too narrow. Unbuffered. unprotected



Get Into It

# Concepts

- General layout of Each Facility Type
  - Bike-only side path
  - Two-way Cycletrack
- Preserves existing sidewalk
- Dedicated facility for bikes and micromobility, e.g., scooters
- Lane Repurposing to calm vehicle traffic



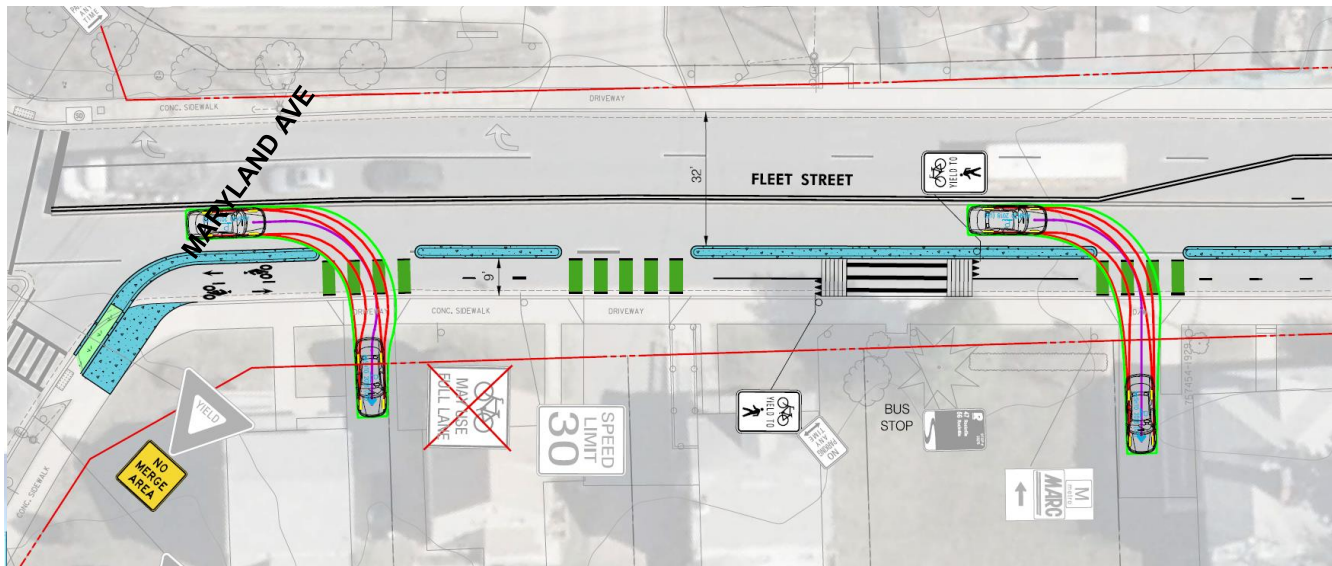
# Details and Options for Discussion

- Driveways
- Intersection crossings
  - Fleet St. / Monroe St.
  - Jefferson St. / Monroe St.
- Termination points / Tying into existing infrastructure
- Bus stop
- Traffic impacts
- Construction Cost
- Curbside parking spaces



# Backing up onto Fleet St

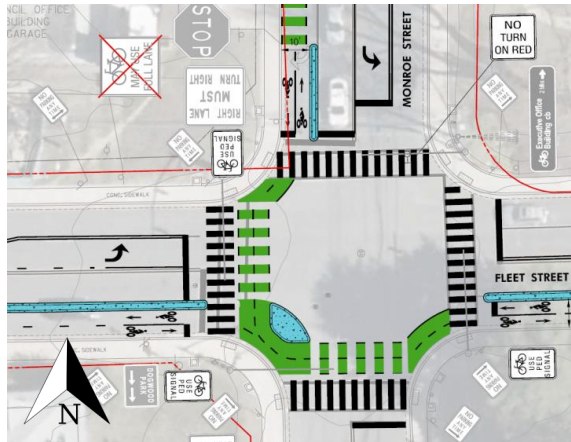
- Adjustments to vertical barriers as need to reflect Turning Movement
  - Drivers will need wider clearance to execute backing maneuvers from driveway



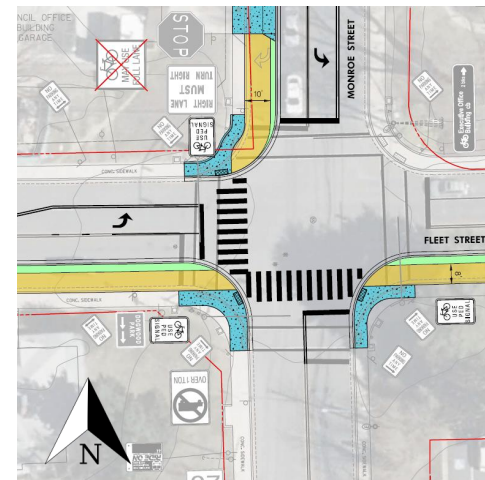


# Crossing Fleet / Monroe with WALK

- Shared pedestrian-bike crossing / no signal phase changes
  - Geometric changes desirable to push cyclists into viewshed of southbound right-turning vehicles. Add LPI
- Separated (but simultaneous) bike & pedestrian crossings
  - Protected intersection & LPI
    - Slows vehicles and cyclists at conflict point



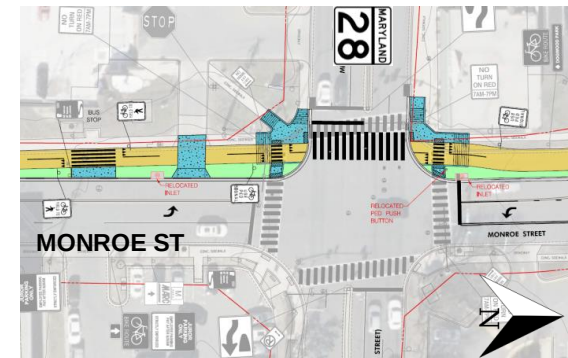
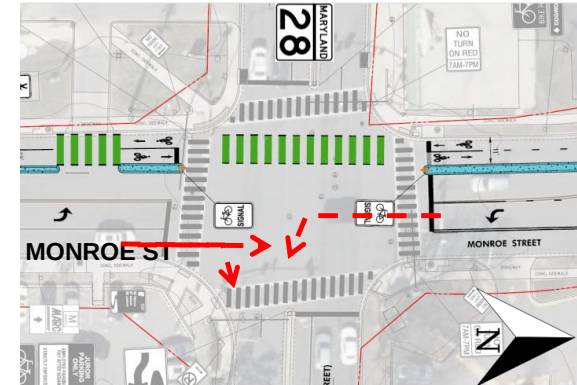
Applicable where  
turn volumes are  
low



# Crossing Jefferson (MD 28)

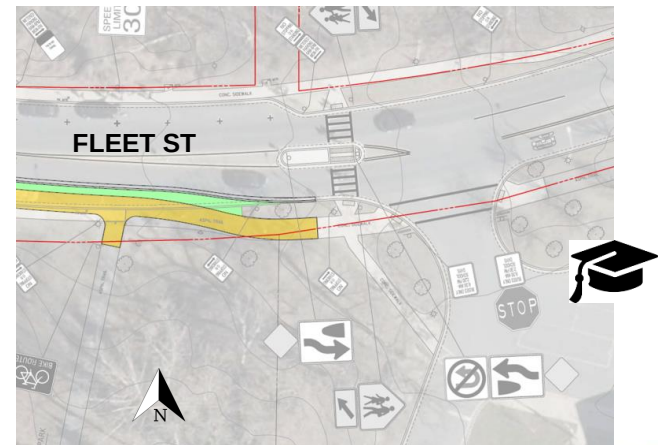
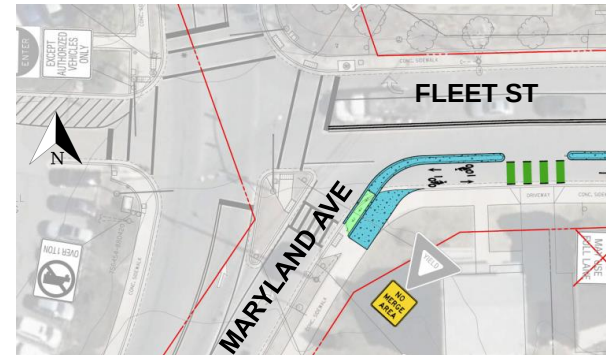


- Bike signals not currently permitted on MDOT SHA roads.
- Per Current SHA standards, bikes can cross with a protected WALK phase. NB protected Left-turn and SB through-rights would have to be held.
  - 1) allow NB through-rights concurrently / SB left permitted
  - 2) restrict left turns and NB is 1 through and 1 right lane
- Shared pedestrian-bike crossing
  - Geometric changes desirable to push cyclists to be more in the viewshed of southbound right-turning vehicles
  - Leading Pedestrian Interval
  - Still would need SHA Concurrence



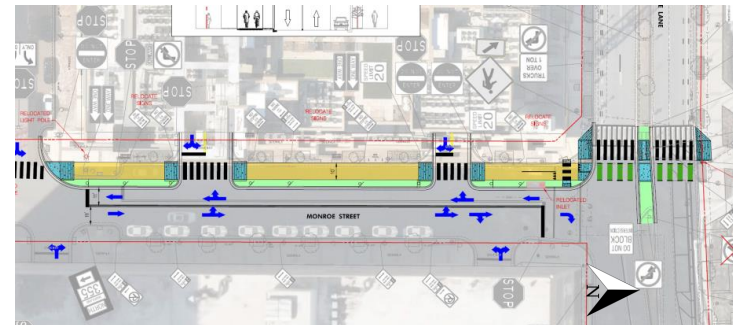
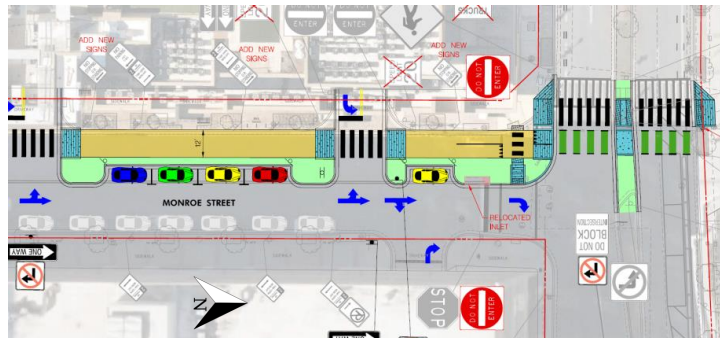
# Southern Termini

- At Fleet/Maryland
  - All bike lane/path options have infrastructure terminating at a raised and widened landing area at the southeast corner of Fleet/Maryland
- At RMHS
  - Side path or 2-way facility turns blends into existing side path, just to the west of existing crosswalk across Fleet St and Richard Montgomery High School



# Terminus Options at East Middle Lane

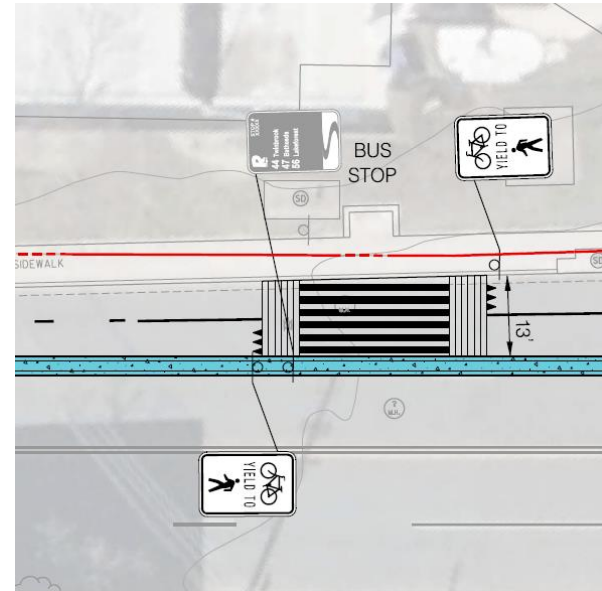
- Both options employ a side path north of Monroe Place
  - However, Curbside Parking on both sides and two-traffic limit space
- North of Montgomery Ave – only 100 cars/day southbound
  - Remove SB lane / Retains curbside parking
  - Optionally, keep SB travel lanes at expense of curbside parking





# Accommodating Bus Stop Crossings

- All bus stops remain at current locations
- Bus stops are:
  - widened to allow alighting from both bus doors
  - raised to provide a bus stop level with sidewalk
- Bus boarders cross sidewalk and side path / bicycle lanes
  - raised bus stop, pavement markings, and signs indicate that bicyclists are encroaching on bus stop space and must yield to transit riders



# Traffic Impacts: LOS AM (PM)

| Intersection                 | Existing Conditions | Bike Path | 2-way Cycletrack exclusive WALK at MD 28 | Cycletrack with concurrent NB traffic at MD 28 |
|------------------------------|---------------------|-----------|------------------------------------------|------------------------------------------------|
| Monroe St & E Middle Ln      | <b>A (B)</b>        | A (B)     | A (B)                                    | A (B)                                          |
| Monroe St & E Montgomery Ave | <b>A (A)</b>        | A (A)     | A (A)                                    | A (A)                                          |
| Monroe St & Monroe Pl        | <b>A (A)</b>        | A (A)     | A (A)                                    | A (A)                                          |
| Monroe St & E Jefferson St   | <b>B (C)</b>        | B (C)     | C (D)                                    | C (C)                                          |
| Monroe St & Fleet St         | <b>B (B)</b>        | B (B)     | B (B)                                    | B (B)                                          |
| Maryland Ave & Fleet St      | <b>C (E)</b>        | C (E)     | C (E)                                    | C (E)                                          |



Spare Capacity on Monroe allows for conversion to one lane in each direction with a center left-turn lane and minimal impact



Get Into It

## Construction Cost

- Path Only Option
  - \$1,000,000
- Primary 2-way Cycletrack Option
  - \$400,000

## Lost Parking

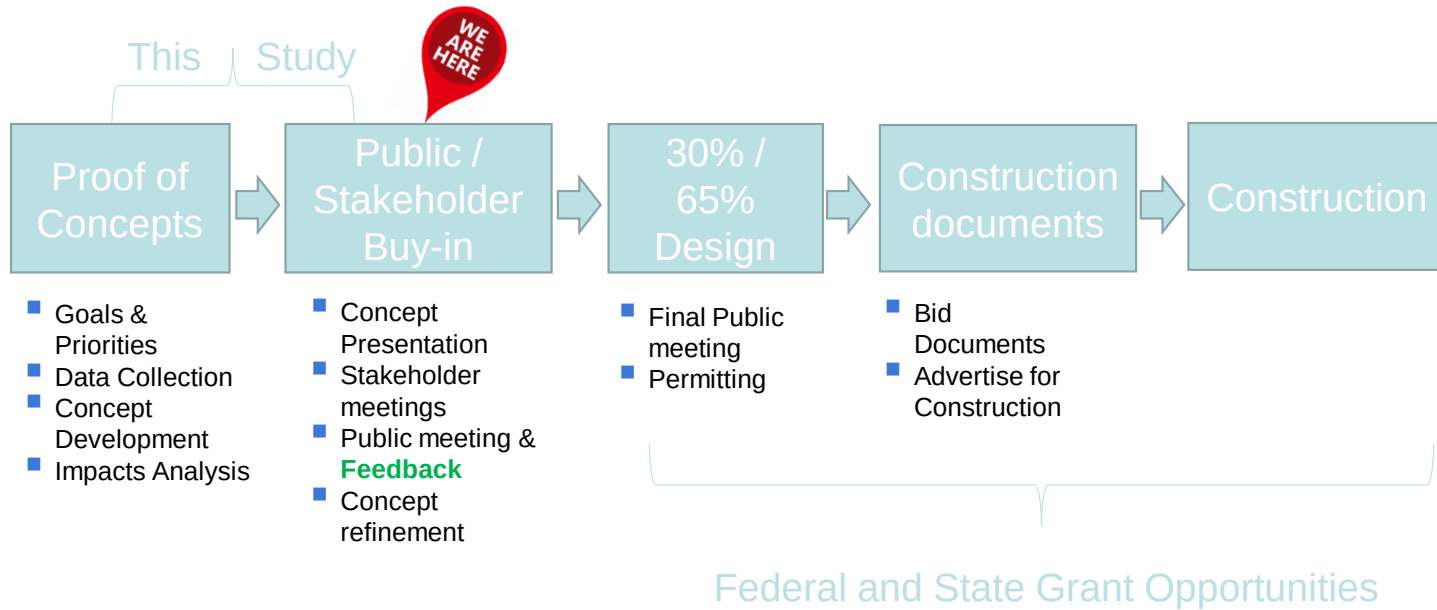
- All Options will remove 7 spaces on Fleet St, east of Monroe St
- Option for 4 spaces removed on Monroe St between Monroe Place and Montgomery Ave
- Option for 5 spaces removed on Monroe St between Montgomery Ave and Middle Lane

Optionally-lost spaces would be due to retaining two-way driving operations



Get Into It

# Next Steps / Project Flow





# Questions & Feedback

- City of Rockville, Project Manager
  - Bryan Barnett-Woods  
[bbwoods@rockvillemd.gov](mailto:bbwoods@rockvillemd.gov) (240) 314-8527
- Mead & Hunt, Engineering Consultant
  - Bryon White, PE  
[bryon.white@meadhunt.com](mailto:bryon.white@meadhunt.com), (443) 741-3652
- MWCOG Liasion
  - Justine Velez [jvelez@mwkog.org](mailto:jvelez@mwkog.org)



ATTACHMENT B



**CITY OF ROCKVILLE  
MARYLAND  
GENERAL CONDITIONS AND INSTRUCTIONS**

1. **TERMS AND CONDITIONS** The terms and conditions of this **Attachment B** govern in event of conflict with any terms of the offeror's proposal and are not subject to change by reasons of written or verbal statement by the Contractor unless accepted in writing. Words and abbreviations that have well known technical or trade meanings are used in accordance with such meanings.

In the event of a conflict between the terms, conditions and instructions of this **Attachment B** and the Federal And State Of Maryland General Conditions contained on Page 4 of this document, the Federal and State of Maryland terms, conditions and instructions shall prevail.

2. **SEVERABILITY** If one or more provisions of any subsequent agreement, or the application of any provision to any party or circumstance, is held invalid, unenforceable, or illegal in any respect, the remainder of the agreement and the application of the provision to other parties or circumstances shall remain valid and in full force and effect.
3. **PREPARATION** All bids are to be submitted electronically, in a pdf format file, via a City designated bid receipt software solution. File name of the pdf document must contain the RFP Number, Offeror's Name and the Proposal Due Date.

Conditional bids/proposals and bids/proposals containing escalator clauses will not be accepted. Bids/proposals must be signed (electronic signature is acceptable) by an individual authorized to bind the offeror.

4. **LATE BIDS/PROPOSALS** It is the offeror's responsibility to assure delivery of the proposal at the proper time via the designated electronic, software solution. Proposals delivered in any other fashion will not be considered.
5. **PROPOSAL AWARD** The award will be made to the offeror whose proposal, in the opinion of the City is the best taking into consideration all aspects of the offeror's responses. In the event that the offeror to whom the award is made does not execute a contract within 15 days from receipt of the contract, the City may give notice to such offeror of intent to award the contract to the next most qualified offeror, or to call for new proposals.
6. **ADDENDUM** In the event that any addenda to this solicitation is issued, all solicitation terms and conditions will retain in effect unless they are specifically changed in the addendum. It is the responsibility of the bidder/proposer to make inquiry as to addenda issued. Oral answers to questions relative to interpretation of specifications or the proposal process will not be binding on the City. Such addendums, if issued, will be posted at: <https://www.rockvillemd.gov/bids.aspx> and <https://emma.maryland.gov/>.

Please note, that it is the bidder's/proposer's responsibility to check this site frequently for Addendums, which may impact pricing, this document's requirements, terms and/or conditions. Failure to

ATTACHMENT B

acknowledge an addendum on the proposal form or to sign and return an Addendum with your response may result in disqualification of proposal.

7. **ACCEPTANCE/REJECTION OF BIDS** The City reserves the right to reject any or all bids in part or full and to waive any technicalities or informalities as may best serve the interests of the City. Bids shall be valid for a minimum of 120 days following the deadline for submitting offers. Bids may not be withdrawn during that period. If an award is not made during that period, all offers shall be automatically extended for another 120 days. Offers will be automatically renewed until such time as either an award is made or proper notice is given to the Purchasing Agent of Offeror's intent to withdraw its offer. Offers may only be canceled by submitting Notice at least 15 days before the expiration of the then current 120-day period.
8. **MULTI-YEAR BIDS** Multi-year contracts may be continued each fiscal year only after funding appropriations have been granted. In the event necessary funding appropriation is not granted, the multi year contract shall be null and void, effective July 1st of the affected year.
9. **BID/PROPOSAL WITHDRAWAL** Proposals may be electronically withdrawn (deleted) or modified by deleting the initial file uploaded and replacing it with a modified file using the City's electronic, software solution before the time specified.
10. **MISTAKES** Offerors/proposers are expected to be thoroughly familiar with all solicitation documents, including all addenda. No consideration will be granted for any alleged misunderstanding of the intent of the specifications. Each bidder/proposer shall carefully and thoroughly examine these documents for completeness. No claim of any bidder/proposer will be allowed on the basis that these documents are incomplete.
11. **SENSITIVE DOCUMENTS** Sensitive documents (either electronic or hardcopy documents dealing with critical facilities or sensitive information) received from the City must be handled consistent with the terms of non-disclosure required for application. Contractor is responsible to restrict use of sensitive documents to project participants only and shall take appropriate measure to prevent distribution of sensitive document to anyone inside or outside of the Contractor's company except Contractor's project participants. After completion of the project, all sensitive documents remaining in the Contractor's possession shall continue to be governed under the terms of non-disclosure and must continue to be store in a secure manner. After such records are no longer need for record purposes, the records shall be destroyed or returned to the City.

Where services require the Contractor to access the City's electronic information resources and/or its electronic data assets, the Contractor shall adhere to all requirements, terms and conditions of the City's Contractor/Vendor On-Site and Remote Access Confidentiality Agreement, which can be viewed at the following web address:

<https://www.rockvillemd.gov/DocumentCenter/View/36407/IT-ACCESS-CONFIDENTIALITY-POLICY?bidId=>

12. **DOCUMENTS, MATERIALS AND DATA** All documents materials or data developed as a result of this contract are the City's property. The City has the right to use and reproduce any documents, materials and data, including confidential information, used in the performance of, or developed as a result of this contract. The City may use this information for its own purposes, including reporting to state and federal agencies. The contractor warrants that it has title to or right to use all documents, materials or data used or developed in connection with this contract. The Contractor must keep confidential all documents, materials and data prepared or developed by the contractor or supplied by the City.

ATTACHMENT B

13. **PUBLICITY** Contractor agrees that it shall not publicize any subsequent agreement or disclose, confirm or deny any details thereof to third parties or use any photographs or video recordings of the City of Rockville's name in connection with any sales promotion or publicity event without the prior express written approval of the City.
14. **INTEREST IN MORE THAN ONE BID/PROPOSAL AND COLLUSION** Multiple proposals uploaded/received in response to a single solicitation from an individual, firm, partnership, corporation, affiliate, or association under the same or different names will be rejected. Reasonable grounds for believing that an offeror is interested in more than one proposal for a solicitation both as an offeror and as a subcontractor for another offeror, will result in rejection of all proposals in which the offeror is interested. However, a firm acting only as a subcontractor may be included as a subcontractor for two or more offerors submitting a proposal for the work. Any or all proposals may be rejected if reasonable grounds exist for believing that collusion exists among any offerors. Offerors rejected under the above provisions shall be disqualified if they respond to a re-solicitation for the same work.
15. **EXECUTION OF CONTRACT** The Contractor shall be required to execute a formal agreement with the City within fifteen days from the award.
16. **COMPENSATION** Refer to Section 4 - Payment
17. **INVOICING** The Contractor shall submit invoices, in duplicate, which shall include a detailed breakdown of all charges for that monthly period including employee names, date of services, itemized cost (hours and hourly rates) for service.  
  
Invoices shall be based upon completion of tasks and deliverables consistent with the schedule of payments stipulated in the Contract, and shall reference a City Purchase Order number. All such invoices will be paid promptly by the City of Rockville unless any items thereon are disputed in which event payment will be withheld pending verification of the amount claimed and the validity of the claim. The firm shall provide complete cooperation during any such investigation. All invoices shall be forwarded to the following address: City of Rockville, Attn: (Project Manager), 111 Maryland Avenue, Rockville, MD 20850 or via email to the project manager.
18. **ELECTRONIC PAYMENT OPTION** The Vendor ACH Payment Program of the City allows payments to be deposited directly to a designated financial institution account. Funds will be deposited into the account of your choice automatically and on time. All transactions are conducted in a secure environment. The program is totally free as part of the Finance Department's efforts to improve customer services. Program information and registration can be viewed at the following web address:  
  
<http://www.rockvillemd.gov/index.aspx?nid=234>
19. **PAYMENT TO SUBCONTRACTOR** Within seven (7) days after receipt of amounts paid by the City for work performed by a subcontractor under this contract, the Contractor shall either: Pay the Subcontractor for the proportionate share of the total payment received from the City of Rockville attributable to the work performed by the Subcontractor under this contract; or Notify the City of Rockville and Subcontractor, in writing, of his/her intention to withhold all or a part of the Subcontractor's payment and the reason for non-payment.
20. **PERSONNEL** Principal or key personnel included in the proposal may not be substituted without written approval of the City of Rockville. Replacements for key personnel under the contract must have equivalent professional qualifications and experience as those individuals listed in the proposal.



ATTACHMENT B

The Consultant must submit written professional qualifications and experience for approval within ten working days prior to replacement for City review and approval or rejection.

21. **PRICE ADJUSTMENTS (CPI)** Unless otherwise stated in the RFP document, rates quoted are to be firm for two (2) years after award of a contract. These rates will apply to additional work, change orders and contract modifications. A request for price adjustment after the 2-year period is subject to approval or rejection by the Purchasing Agent. The Consultant shall submit to the Purchasing Agent sufficient justification to support the Consultant's request. A request for price adjustment may not be approved which exceeds the amount of the annual percentage change of the Consumer Price Index (CPI) for the twelve-month period immediately prior to the date of the request.
22. **INTERPRETATION** Any questions concerning general instruction and specifications shall be directed in writing to the Procurement Division. The submission of a bid/proposal shall be prima facie evidence that bidder/proposer thoroughly understands the terms of the specification. The Contractor shall take no advantage of any error or omission in the specifications.
23. **DELIVERY** All time limits stated in the contract documents are of the essence. The Contractor shall expedite the work and achieve substantial completion within the contract time. If time limits are not specified, state the number of days required to make delivery/completion in the space provided. Defective or unsuitable materials or workmanship shall be rejected and shall be made good by the Contractor, notwithstanding that such materials/workmanship have been previously overlooked and accepted.
24. **DELAYS/EXTENSION OF TIME** If the Contractor is delayed in the delivery of the supplies, equipment or services by any act or neglect of the City or by a separate Contractor employed by the City, or by any changes, strikes, lockouts, fires, unusual delays in transportation or delay authorized by the City, the City shall review the cause of such delay and shall make an extension if warranted.  
  
All claims for extensions must be a written notice sent to the Purchasing Agent within ten (10) calendar days after the date when such alleged cause for extension of time occurred. All such claims shall state specifically the amount of the delay the Contractor believes to have suffered. If statement is not received within the prescribed time the claim shall be forfeited and invalidated.
25. **TERMINATION FOR DEFAULT** The contract may be cancelled or annulled by the City in whole or in part by written notice of default to the Contractor upon nonperformance or violation of contract terms and an award may be made to second ranked proposer, if default occurs within the initial contract period and the second ranked proposer agrees to hold its proposal price, or the work may be purchased on the open market similar to those so terminated. In either event, the defaulting Contractor (or his surety) shall be liable to the City for costs to the City in excess of the defaulted contract prices.
26. **TERMINATION FOR CONVENIENCE** The performance of work or services under this contract may be terminated in whole or part, upon five (5) calendar day's written notice when the City determines that such termination is in its best interest. The City shall be liable only for those accepted goods and/or services furnished prior to the effective date of such termination.
27. **ABANDONMENT, DISSOLUTION AND RESTRUCTING** A Contractor who abandons or defaults the work on this contract and causes this contract to be re-bid will not be considered in future bids for the same type of work unless the scope of the work is significantly changed. Written notification of changes to company name, address, telephone number, etc. shall be provided to the City of Rockville as soon as possible but not later than thirty (30) days from date of change.

ATTACHMENT B

28. **CHANGES** The City, without invalidating the contract, may order written changes in the scope of work consisting of additions, deletions or modification with the contract sum and time being adjusted accordingly. All such changes shall be made in writing by the Purchasing Agent.

Costs shall be limited to the following: cost of materials, cost of labor and additional costs of supervision and field office personnel directly attributable to the change.

The cost or credit to the City from a change in the scope of work shall be determined by mutual agreement. The Contractor shall do all work that may be required to complete the work contemplated at the unit prices or lump sum to be agreed upon.

No alterations or variables in the terms of the contract shall be valid or binding upon the City unless made in writing and signed by the City.

29. **EXTRA COSTS** If the Contractor claims that any instructions by drawings or otherwise involve extra cost or extension of time, a written request must be submitted to the Project Manager within ten (10) calendar days after receipt of such instructions and before proceeding to execute the work, stating in detail the basis for objection. No such claim will be considered unless so made.

Any discrepancies which may be discovered between actual conditions and those represented by the specifications and/or drawings shall be reported to the City and work shall not proceed, until written instruction has been received by the Contractor from the City. On drawings the figured dimensions shall govern in the case of discrepancy between the scales and figures.

Anything shown on applicable plans and not mentioned in the specifications or mentioned in the specifications and not shown on the plans have the same effect as if shown or mentioned respectively on both.

30. **GUARANTEE** All guarantees and warranties required shall be furnished by the Contractor and shall be delivered to the Project Manager before final payment is made.

The Contractor guarantees that the items conform to the design and specifications and to drawings, samples or other descriptions referred to in this document. The Contractor further guarantees the items will be free from defects in materials and workmanship, latent or patent and are suitable for the intended purpose as far as the Contractor knows or has reason to know. The guarantee contained herein shall remain in full force and effect for a minimum of one year after initial delivery to the City unless another effective period is specified.

31. **RIGHT TO AUDIT** At any time during the term of any subsequent agreement and for a period of four (4) years thereafter the City of Rockville or duly authorized audit representative of the City, at its expense and at reasonable times, reserves the right to incrementally audit Contractor's records. In the event such an audit by the City reveals any errors/overpayments by the City, Contractor shall refund the City the full amount of such overpayments within thirty (30) days of such audit findings, or the City at its option, reserves the right to deduct such amounts owing the City from any payments due Contractor.

32. **DEFECTIVE SUPPLIES/SERVICE** Defective or unsuitable materials or workmanship shall be rejected and shall be made good by the Contractor. Contractor shall be responsible for the professional quality, technical accuracy, timely completion, and the coordination of all its effort and other services furnished by Contractor under the Agreement. Without additional compensation, Contractor shall correct or revise any errors, omissions, or other deficiencies in all products of its efforts and other

ATTACHMENT B

services provided. This shall include resolving any deficiencies arising out of the acts or omissions of Contractor found during or after the course of the services performed by or for Contractor under this Agreement, regardless of City having knowledge of or condoning/accepting the products or the services. Correction of such deficiencies shall be at no cost to City.

33. **LEGAL REQUIREMENTS** All materials, equipment, supplies and services shall conform to applicable Federal, State County and City laws, statutes, rules and regulations. The Contractor shall observe and comply with all Federal, State, County and City laws, statutes, rules and regulations that affect the work to be done. The provisions of this contract shall be governed by the laws of the State of Maryland.

34. **SUBCONTRACTING** When allowed, proposers who intend to subcontract any portion of the work including delivery, installation or maintenance will submit to the City prior to the start of work: 1) a description of the items to be subcontracted; 2) all subcontractor names, addresses and telephone numbers; and 3) the nature and extent of the work utilized during the life of the contract.

This does not relieve the Contractor from the prime responsibility of full and complete performance under the contract. There shall be no contractual relationship between the City and any subcontractor.

35. **RESERVATIONS** The City reserves the right to add or delete any item(s) from the proposal in whole or in part at the City's discretion without affecting the proposal prices for any item or remaining work.

The City may waive minor differences in specifications in proposals provided these differences do not violate the specifications' intent nor materially affect the operation for which the items are being purchased.

36. **AUTHORITY OF THE CITY MANAGER IN DISPUTES** Except as may otherwise be provided by the final agreement, any dispute concerning a question of fact arising under the agreement signed by the City and the Contractor which is not disposed of by the final agreement shall be decided by the City Manager who shall notify the Contractor in writing of his determination. The Contractor shall be afforded the opportunity to be heard and offer evidence in support of the claim. Pending final decision of the dispute herein, the Contractor shall proceed diligently with performance under the agreement signed by the City and the Contractor. The decision of the City Manager shall be final and conclusive unless an appeal is taken pursuant to City Purchasing Ordinance.

37. **INDEMNIFICATION OF THE COUNCIL** The Contractor shall indemnify and save harmless the Mayor and Council from all suits, actions and damages or costs, of every name and description to which the Mayor and Council may be subjected or put by reason of injury to persons or property as a result of the work, whether caused by negligence or carelessness on part of the Contractor, or subcontractors or agents of the Contractor.

38. **NO LIMITATION OF LIABILITY** The mention of any specific duty or liability of the Contractor in any part of the specification shall not be construed as a limitation or restriction upon any general liability or duty imposed upon the Contractor.

39. **PROPRIETARY INFORMATION** The City agrees, to the extent permitted by law, to hold all material and information belonging to the offeror, which it deems to be confidential, in strictest confidence. The Contractor agrees to hold all material and information belonging to the City or the City's agents in strictest confidence and not to make use thereof other than for the performance of contractual obligations, to release it only to employees requiring such information. Reasonable precautions will be exercised for the protection of any proprietary data included in the proposal.

ATTACHMENT B

40. **RELEASE OF INFORMATION** During the term of the final agreement, the successful Contractor shall not release any information related to the services or the performance of the services under the agreement nor publish any final reports or documents without the prior written approval of the City.

41. **PATENTS AND ROYALTIES** Whenever any article, material, appliance, process composition, means or things called for by these specifications is covered by Letter of Patent, the successful offeror must secure, before using or employing such materials, the assent in writing of the owner or licensee of such letters of patent, and file the same with the City.

The Contractor will defend, at its own expense, and will pay the cost and damages awarded in any action brought against the City based on any allegation that the items provided by the Contractor infringe on a patent and copyright license or trade secret. In the event that an injunction shall be obtained against the City's use of items by reason of infringement of any patent, copyright, license or trade secret, the Contractor will, at its expense, procure for the City the right to continue using the items, replace or modify the same so that it becomes non-infringing.

42. **MISCELLANEOUS PROVISIONS** The City and the Contractor each bind themselves, their partners, successors, assign and legal representatives of such other parties in respect to all covenants, agreements, and obligations contained in the contract document. Neither party to the contract shall assign the contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any monies due or to become due hereunder without the previous written consent of the City. Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or to any officer of the corporation for whom it was intended if delivered or sent by registered or certified mail to the last known address.

Duties and obligations imposed by the contract documents and the rights and remedies available thereunder shall be in addition to and not a limitation of the duties, obligations, rights and remedies otherwise imposed or available by law, unless so indicated.

43. **ETHICS REQUIREMENTS** In accordance with the City's financial disclosure and ethical conduct policy and/or ordinances a prerequisite for payment pursuant to the terms of this contract is that the Contractor may be required to furnish explicit statements, under oath, that the City Manager, and/or any other officer, agent, and/or employee of the City, and any member of the governing body of the City of Rockville or any member or employee of a Commission, Board, or Corporation controlled or appointed by the City Council, Rockville, Maryland has not received or has not been promised directly or indirectly any financial benefit by way of fee, commission, finder's fee, or in any other manner, remuneration arising from directly or indirectly related to this contract, and that upon request by the City Manager, or other authorized agent, as a prerequisite to payment pursuant to the terms of this contract, the Contractor will furnish to the Mayor and Council of the City of Rockville, under oath, answers to any interrogatories to a possible conflict of interest has herein embodied.

44. **BROKERING** The Contractor warrants that only an established commercial or selling agency maintained by the Contractor for the purpose of securing business may be retained to solicit or secure this contract. Any brokerage arrangements must be disclosed in the proposal. For violation of this warranty, the City shall have the right to terminate or suspend this contract without liability to the City.

45. **EQUAL EMPLOYMENT OPPORTUNITY** The Contractor will not discriminate against any employee or applicant for employment because of age (in accordance with applicable law), ancestry, color, national origin, race, ethnicity, religion, disability, genetics, marital status, pregnancy, presence of children, gender, sexual orientation, gender identity or expression, or veteran status. The Contractor will take affirmative action to ensure that applicants are employed, and the employees are treated fairly



ATTACHMENT B

and equally during employment with regard to the above. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment, layoff or termination, rates of pay or other form of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause. Contractors must also include the same nondiscrimination language in all subcontracts.

If the Contractor fails to comply with nondiscrimination clauses of this contract or fails to include such contract provisions in all subcontracts that subcontractors will not discriminate against any employee or applicant for employment in the manner described above, this contract may be declared void AB INITIO, cancelled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further contracts with the City of Rockville. Any employee, applicant for employment, or prospective employee with information concerning any breach of these requirements may communicate such information to the City Manager who shall commence a prompt investigation of the alleged violation. Pursuant to such investigation, the Contractor will permit access to the Contractor's books, records, and accounts. If the City Manager concludes that the Contractor has failed to comply with nondiscrimination clauses, the remedies set out above may be invoked.

46. **LANGUAGE** If applicable, the Contractor shall appoint one or more crew members or supervisors to act as liaison with the City and emergency service personnel. All liaisons shall be fluently bilingual in English and the Contractor's employees' language(s), and at least one liaison shall be present at each work site at all times when any of the Contractor's employees or agents are at the site.
47. **IMMIGRATION REFORM AND CONTROL ACT** Contractor warrants that it does not and shall not hire, recruit or refer for a fee, for employment under the Contract, an individual knowing the individual is an unauthorized individual and hire any individual without complying with the requirements of the Immigration Reform and Control Act of 1986 ("the Act"), including but not limited to any verification and record keeping requirements. Contractor further assures the City that, in accordance with the Act, it does not and will not discriminate against an individual with respect to hiring, or recruitment or referral for a fee, of the individual for employment or the discharging of the individual from employment because of such individual's national origin or in the case of a citizen or intending citizen, because of such individual's citizenship status.
48. **ASSIGNMENT** Neither this contract nor any interest therein nor claim thereunder shall be assigned or transferred by the Contractor except as expressly authorized in writing by the City.
49. **EXCLUSION** As part of the contract, the offeror must warrant that it will not engage in providing consulting or other services to any private entity regarding any property within the study area during the term of the project. This requirement is intended to avoid the appearance of any conflict of interest that may arise. This exclusion also applies to all subcontractors.
50. **OWNERSHIP OF DOCUMENTS** Any and all deliverables, including but not limited to reports, specifications, blueprints, plans, negatives, electronic files and documents, as well as, any other documents prepared by the Contractor in the performance of its obligations under the resulting contract shall be the exclusive property of the City. The Contractor shall not use, willingly allow, or cause such materials to be used for any purpose other than performance of all Contractors' obligations under the resulting contract without the prior written consent of City. Documents and materials developed by the Contractor under the resulting contract shall be the property of City of Rockville; however, the Contractor may retain file copies, which cannot be used without prior written consent of the City. The City agrees that the Contractor shall not be liable for any damage, loss, or injury resulting from the

ATTACHMENT B

future use of the provided documents for other than the project specified, when the Contractor is not the firm of record.

51. **NON-DISCLOSURE** Contractor and the City of Rockville acknowledge that they or their employees may, in the performance of any subsequent agreement come into the possession of proprietary or confidential information owned by or in the possession of the other. Neither party shall use any such information for its own benefit or make such information available to any person, firm, corporation, or other organizations, whether or not directly or indirectly affiliated with Contractor or the City unless required by law.
52. **COOPERATIVE PROCUREMENT** The Contractor may extend all of the terms, conditions, specifications, and unit or other prices of any award resulting from this solicitation to any and all other public bodies, subdivisions, school districts, community colleges, colleges, and universities. The City assumes no authority, liability or obligation, on behalf of any other public entity that may use any contract resulting from this solicitation.

ATTACHMENT C

**CITY INSURANCE REQUIREMENTS**

Prior to execution of the contract by the City, the Contractor must obtain at their own cost and expense and keep in force and effect during the term of the contract including all extensions, the following insurance with an insurance company/companies licensed to do business in the State of Maryland evidenced by a certificate of insurance and/or copies of the insurance policies. The Contractor's insurance shall be primary. The Contractor must electronically submit to the Procurement Division a certificate of insurance prior to the start of any work.

In no event may the insurance coverage be less than shown below.

Unless otherwise described in this contract the successful contractor and subcontractors will be required to maintain for the life of the contract and to furnish the City evidence of insurance as follows:

| <b>Type of Insurance</b>                                                                                                                                                                                                          | <b>Amounts of Insurance</b>                                                                                                                                                       | <b>Endorsements and Provisions</b>                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Workers' Compensation</b><br><b>2. Employers' Liability</b>                                                                                                                                                                 | Bodily Injury by Accident:<br>\$100,000 each accident<br><br>Bodily Injury by Disease:<br><br>\$500,000 policy limits<br><br>Bodily Injury by Disease:<br>\$100,000 each employee | Waiver of Subrogation:<br><i>WC 00 03 13 Waiver of Our Rights to Recover From Others Endorsement</i><br><b>– signed and dated.</b>                                                                |
| <b>3. Commercial General Liability</b><br><br>a. Bodily Injury<br>b. Property Damage<br>c. Contractual Liability<br>d. Premise/Operations<br>e. Independent Contractors<br>f. Products/Completed Operations<br>g. Personal Injury | Each Occurrence:<br>\$1,000,000                                                                                                                                                   | City to be listed as additional insured and provided 30 day notice of cancellation or material change in coverage.<br><b>CG 20 37 07 04 and CG 20 10 07 04 forms to be both signed and dated.</b> |
| <b>4. Automobile Liability</b><br><br>a. All Owned Autos<br>b. Hired Autos<br>c. Non-Owned Autos                                                                                                                                  | Combined Single Limit for Bodily Injury and Property Damage -<br>(each accident):<br>\$1,000,000                                                                                  | City to be listed as additional insured and provided 30 day notice of cancellation or material change in coverage.<br><b>Form CA20 48 02 99 form to be both signed and dated.</b>                 |
| <b>5. Excess/Umbrella Liability</b>                                                                                                                                                                                               | Each Occurrence/Aggregate:<br>\$1,000,000                                                                                                                                         | City to be listed as additional insured and provided 30 day notice of cancellation or material change in coverage.                                                                                |
| <b>6. Professional Liability (if applicable)</b>                                                                                                                                                                                  | Each Occurrence/Aggregate:<br>\$1,000,000                                                                                                                                         |                                                                                                                                                                                                   |

ATTACHMENT C

**Policy Cancellation**

No change, cancellation or non-renewal shall be made in any insurance coverage without thirty (30) days written notice to the City's Procurement Division. The Contractor shall electronically furnish a new certificate prior to any change or cancellation date. The failure of the Contractor to deliver a new and valid certificate will result in suspension of all payments and cessation of on-site work activities until a new certificate is furnished.

**Additional Insured**

The Mayor and Council of Rockville, which includes its elected and appointed officials, officers, consultants, agents and employees must be named as an additional insured on the Contractor's Commercial and Excess/Umbrella Insurance for liability arising out of contractor's products, goods, and services provided under the contract. Additionally, the Mayor and Council of Rockville must be named as additional insured on the Contractor's Automobile and General Liability Policies. Endorsements reflecting the Mayor and Council of Rockville as an additional insured are required to be submitted with the insurance certificate.

**Subcontractors**

If applicable, all subcontractors shall meet the requirements of this section before commencing work. In addition, the Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

Example:

Certificate Holder

*The Mayor and Council of Rockville*

City Hall

111 Maryland Avenue

Rockville, MD. 20850



ATTACHMENT D

**Maryland Department of Transportation  
State Highway Administration**

**Certification for Contracts, Grants, Loans, and Cooperative Agreements**

The undersigned certifies, to the best of their knowledge and belief, that:

- 1) No federally 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 an 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 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 subawards at all tiers (including subcontracts, subgrants, and contracts under grants, 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.

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|                               |      |
|-------------------------------|------|
| Contractor/Consultant Name    | Date |
| Signatory position            |      |
| Contractor/Consultant Company |      |

**NAME OF OFFEROR/PROPOSER**  
**RETURN THIS FORM WITH PROPOSAL**

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ATTACHMENT E

**CITY OF ROCKVILLE OFFEROR REFERENCE FORM**

The City of Rockville reserves the right to reject bids from any company not meeting the minimum qualifications. The Offeror shall be a competent and experienced contractor with an established reputation within the community performing the type of work required for this contract. The offeror shall have performed similar work for **a minimum period of five (5) years**. Indicate below a listing of three recent projects completed by your firm that can substantiate past work performance and experience in the type of work required for this contract. The City may make such investigations as it deems necessary to determine the ability of the offeror to perform the work, and the offeror shall furnish to the City all such information and data for this purpose as the City may request.

1. Company Name \_\_\_\_\_  
Address: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Current phone #: \_\_\_\_\_  
Email Address: \_\_\_\_\_  
Contract Amount: \_\_\_\_\_ Name of your project supervisor: \_\_\_\_\_  
Description of Work Performed: \_\_\_\_\_  
\_\_\_\_\_

2. Company Name \_\_\_\_\_  
Address: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Current phone #: \_\_\_\_\_  
Email Address: \_\_\_\_\_  
Contract Amount: \_\_\_\_\_ Name of your project supervisor: \_\_\_\_\_  
Description of Work Performed: \_\_\_\_\_  
\_\_\_\_\_

3. Company Name \_\_\_\_\_  
Address: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Current phone #: \_\_\_\_\_  
Email Address: \_\_\_\_\_  
Contract Amount: \_\_\_\_\_ Name of your project supervisor: \_\_\_\_\_  
Description of Work Performed: \_\_\_\_\_  
\_\_\_\_\_

**NAME OF OFFEROR/PROPOSER** \_\_\_\_\_  
**RETURN THIS FORM WITH PROPOSAL**

ATTACHMENT F  
**A F F I D A V I T**

I hereby affirm that:

I am the \_\_\_\_\_ and the duly authorized representative of the firm of \_\_\_\_\_  
whose address is \_\_\_\_\_

and that I possess the legal authority to make this affidavit on behalf of myself and the firm for which I am acting.

I further affirm:

**AFFIDAVIT OF QUALIFICATION TO  
CONTRACT WITH A PUBLIC BODY**

1. Except as described in Paragraph 2 below, neither I nor the above firm nor, to the best of my knowledge, any of its controlling stockholders, officers, directors, or partners, performing contracts with any public body (the State or any unit thereof, or any local governmental entity in the state, including any bi-county or multi-county entity), has:

A. been convicted under the laws of the State of Maryland, any other state, or the United States of any of the following:

- (1) bribery, attempted bribery, or conspiracy to bribe.
- (2) a criminal offense incident to obtaining, attempting to obtain, or performing a public or private contract.
- (3) fraud, embezzlement, theft, forgery, falsification or destruction of records, or receiving stolen property.
- (4) a criminal violation of an anti-trust statute.
- (5) a violation of the Racketeer Influenced and Corrupt Organization act, or the Mail Fraud Act, for acts in connection with the submission of bids or proposals for a public or private contract.
- (6) a violation of Section 14-308 of the State Finance and Procurement Article of the Annotated Code of Maryland.
- (7) conspiracy to commit any of the foregoing.

B. pled nolo contendere to, or received probation before verdict for, a charge of any offense set forth in subsection A of this paragraph.

C. been found civilly liable under an anti-trust statute of the State of Maryland, another state, or the United States for acts or omissions in connection with the submission of bids or proposals for a public or private contract.

D. during the course of an official investigation or other proceeding, admitted, in writing or under oath, an act or omission that would constitute grounds for conviction or liability under any law or statute described in subsection A or C of this paragraph.

2. [State "none," or as appropriate, list any conviction, plea or admission as described in Paragraph 1 above, with the date, court, official or administrative body, the individuals involved and their position with the firm, and the sentence or disposition, if any]. \_\_\_\_\_

3. I further affirm that neither I nor the above firm shall knowingly enter into a contract with the Mayor and Council of Rockville under which a person or business debarred or suspended from contracting with a public body under Title 16

of the State Finance and Procurement Article of the Annotated Code of Maryland, will provide, directly or indirectly, supplies, services, architectural services, construction related services, leases of real property, or construction.

I acknowledge that this Affidavit is to be furnished to the Mayor and Council of Rockville and, where appropriate, to the State Board of Public Works and to the Attorney General. I acknowledge that I am executing this Affidavit in compliance with the provisions of Title 16 of the State Finance and Procurement Article of the Annotated Code of Maryland which provides that persons who have engaged in certain prohibited activity may be disqualified, either by operation in law or after a hearing, from entering into contracts with the Mayor and Council of Rockville. I further acknowledge that if the representations set forth in this Affidavit are not true and correct, the Mayor and Council of Rockville may terminate any contract awarded, and take any other appropriate action.

**NON—COLLUSION AFFIDAVIT**

1. Am fully informed respecting the preparation and contents of the attached bid and of all pertinent circumstances respecting such bid;

2. Such bid is genuine and is not a collusive or sham bid

3. Neither the said bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other bidder, firm or person to submit a collusive or sham bid in connection with the Contract for which the attached bid has been submitted or to refrain from bidding in connection with Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other bidder, firm or person to fix the price or prices in the attached bid or of any other bidder, or to fix any overhead, profit or cost element of the bid price or the bid price of any other bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Mayor and Council of Rockville, Maryland (Local Public Agency) or any person interested in the proposed Contract; and

4. The price or prices quoted in the attached bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

I do solemnly declare and affirm under the penalties of perjury that the contents of these affidavits are true and correct.

Signature and Title \_\_\_\_\_ Date \_\_\_\_\_

**NAME OF OFFEROR/PROPOSER** \_\_\_\_\_

**RETURN THIS FORM WITH PROPOSAL**

ATTACHMENT G

## RESPONDENT'S QUESTIONNAIRE

The Respondent recognizes that in selecting a company/agent, The City of Rockville will rely, in part, on the answers provided in response to this Questionnaire. Accordingly, Respondent warrants to the best of its knowledge that all responses are true, correct and complete. The City of Rockville reserves the right to contact each and every reference listed on the reference form and shall be free from any liability to respondent for conducting such inquiry.

### Company Profile

1. Number of Years in Business: \_\_\_\_\_
2. Type of Operation: Individual\_\_\_\_ Partnership\_\_\_\_ Corporation\_\_\_\_ Government\_\_\_\_  
**Number of Employees: \_\_\_\_\_(company wide)**  
**Number of Employees: \_\_\_\_\_(servicing location)**  
  
Annual Sales Volume: \_\_\_\_\_(company wide)  
Annual Sales Volume: \_\_\_\_\_(servicing location)
3. State that you will provide a copy of your company's audited financial statements for the past two (2) years, if requested by the City of Rockville.
4. Is your company currently for sale or involved in any transaction to expend or to become acquired by another business entity? If yes, please explain the impact both in organizational and directional terms.
5. Is your company currently in default on any loan agreement or financing agreement with any bank, financial institution, or other entity? If yes, specify date(s), details, circumstances, and prospects for resolution.

**NAME OF OFFEROR/PROPOSER \_\_\_\_\_**  
**RETURN THIS FORM WITH PROPOSAL**