



City of Rockville

Fleet and Monroe Streets, Complete Streets Study

PREPARED FOR THE CITY OF ROCKVILLE BY



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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:



- 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



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



- 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



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.



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

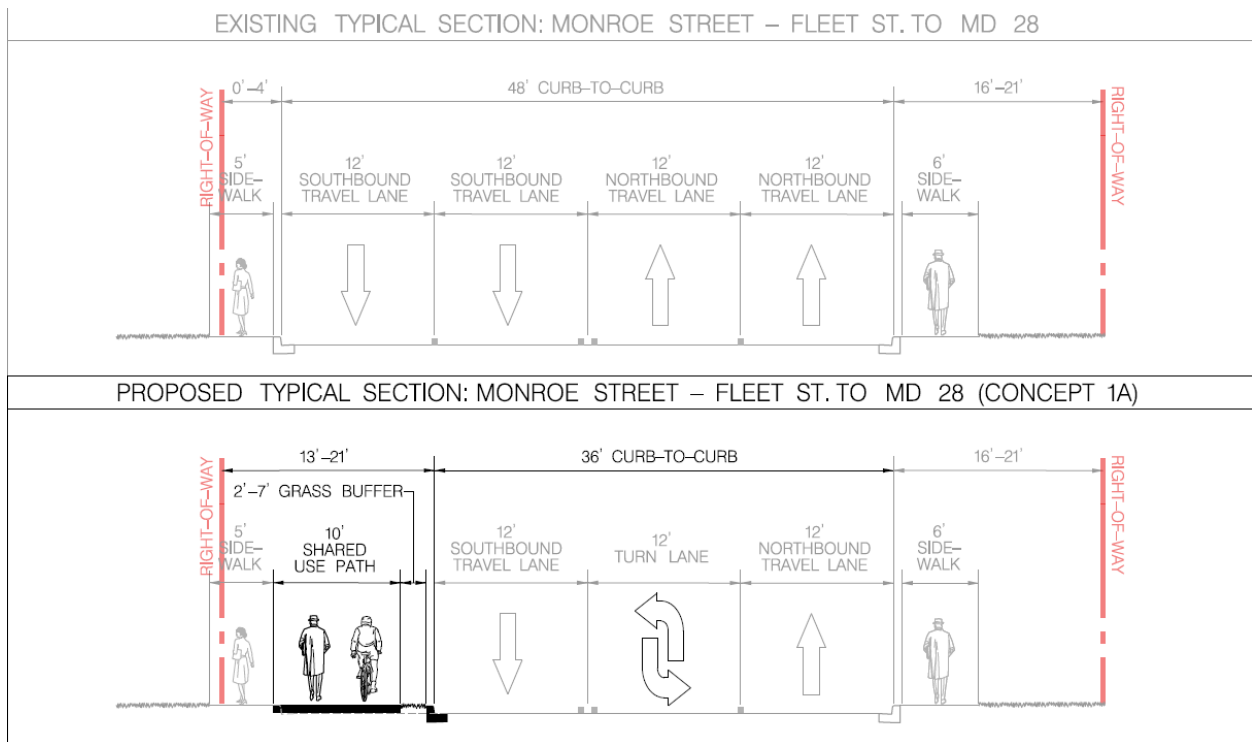


Figure 1: Existing and proposed typical cross section for raised bike path option.

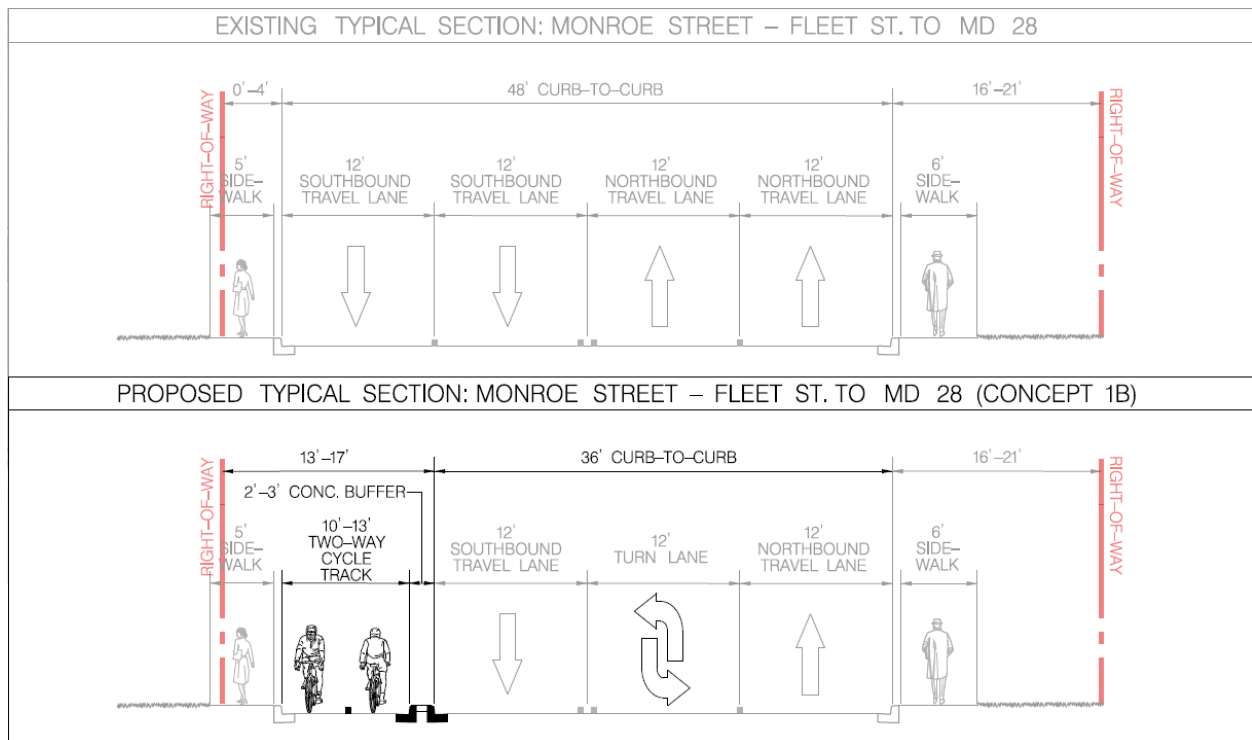


Figure 2: Existing and proposed typical section for on-street two-way cycle track option.



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)

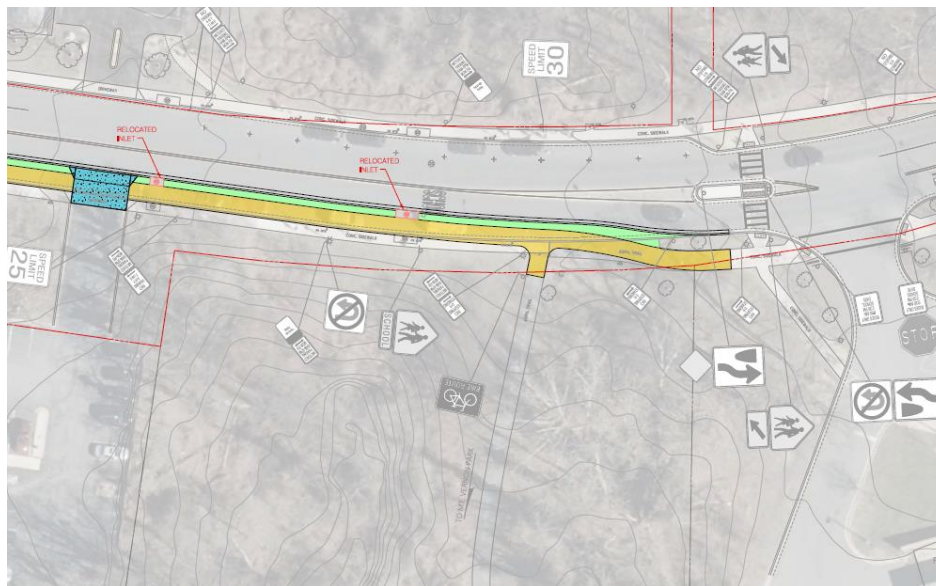


Figure 3: Example of a raised path concept on Fleet Street

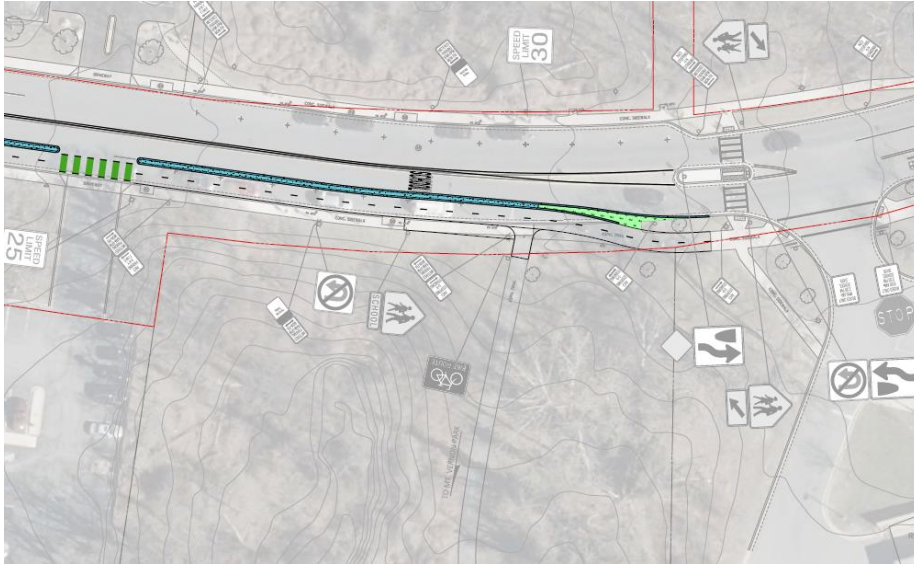


Figure 4: Example of a two-way cycletrack concept on Fleet Street

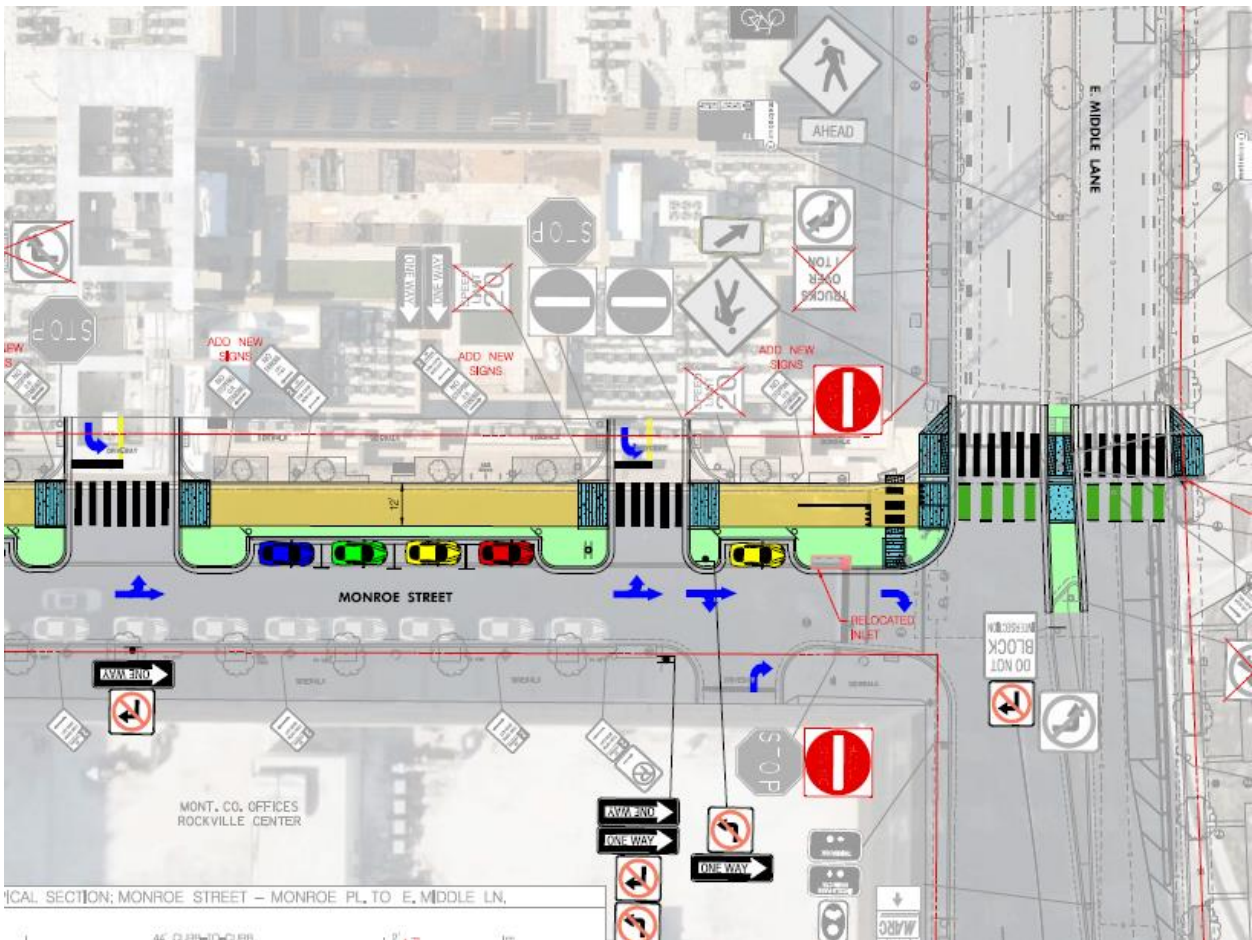


Figure 5: Example of a one way operations on Monroe Street, south of East Middle Lane



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*



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

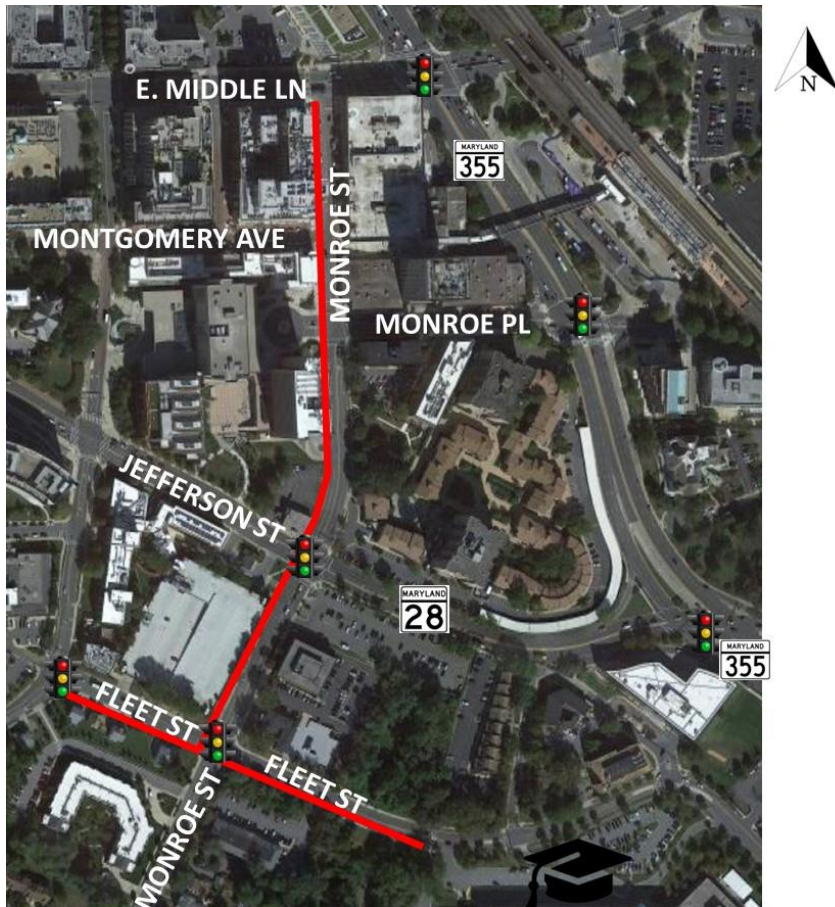


Figure 6: Bike facility project limits and location



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.

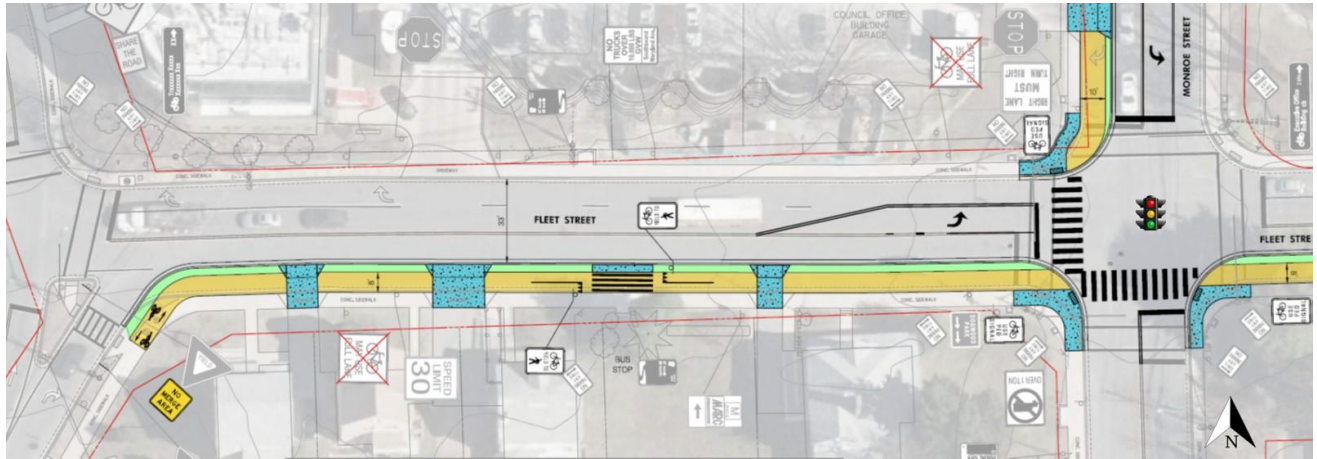


Figure 7: West terminus of bike path option

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.

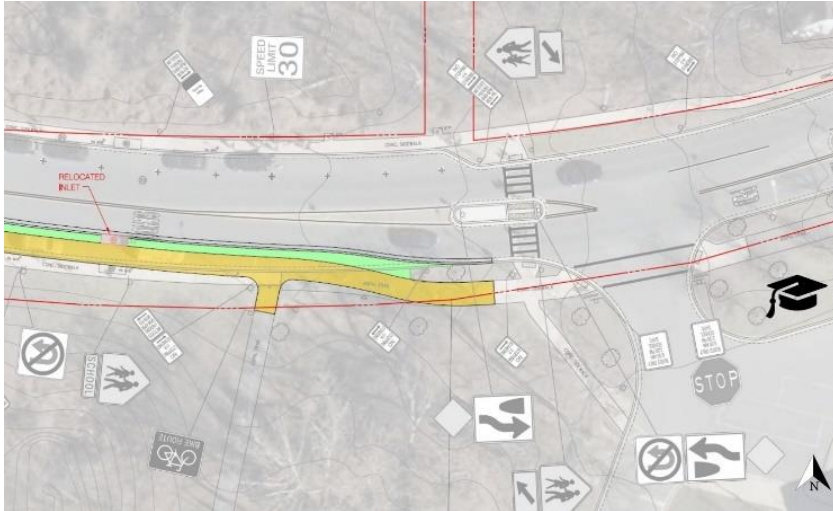


Figure 8: Eastern terminus of proposed bike path at RMHS

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.

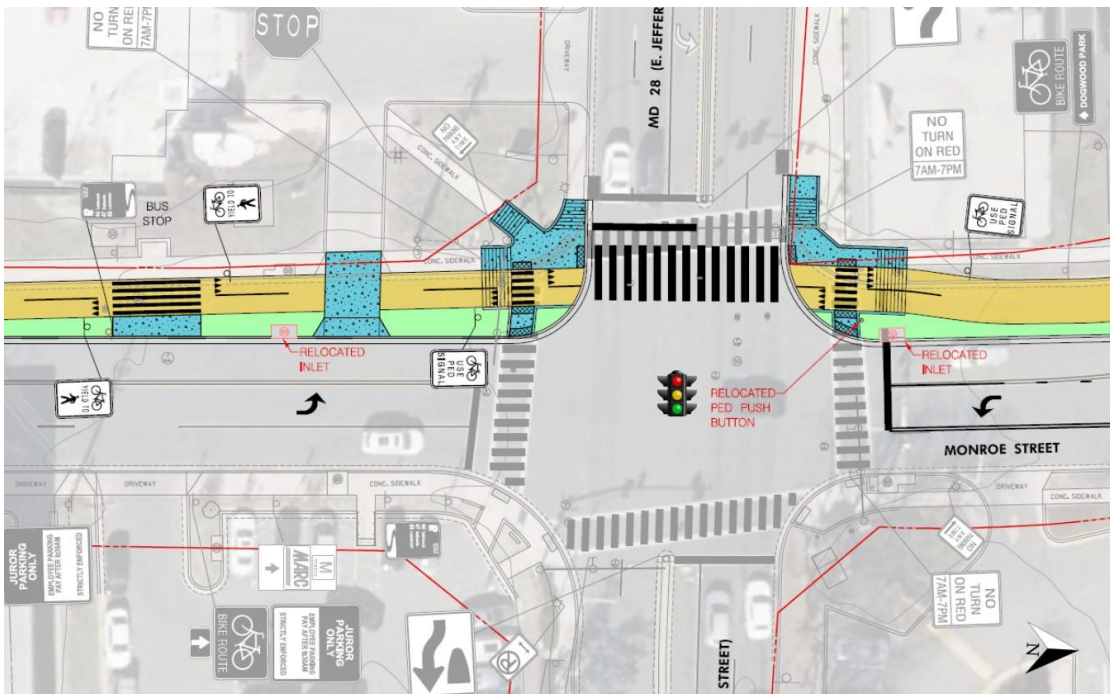


Figure 9: Bike path option, crossing Jefferson Street



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.

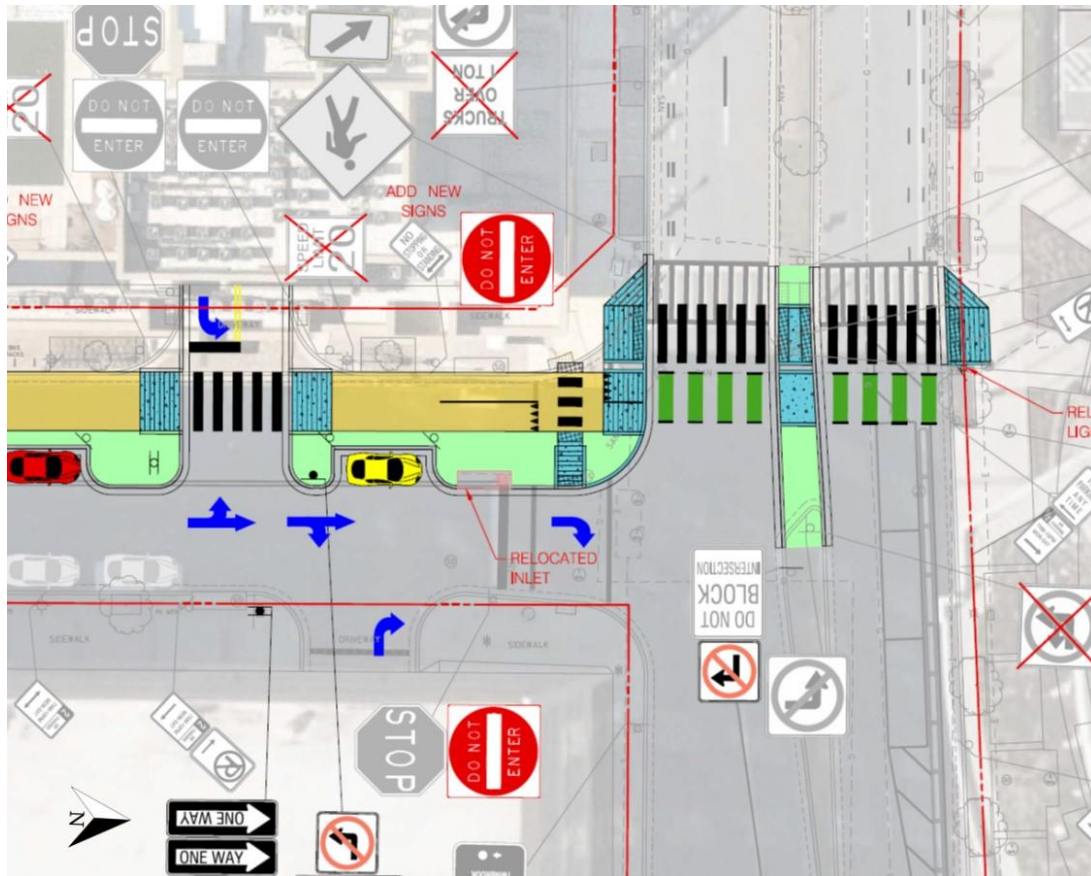


Figure 10: Bike path concept, northern terminus and crossing at East Middle Lane

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.



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.

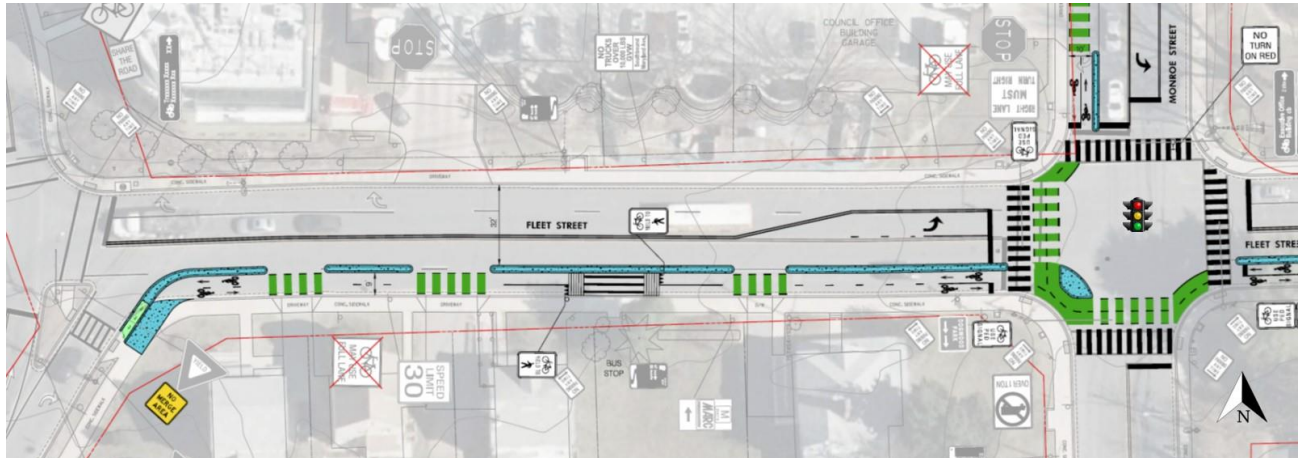


Figure 11: West terminus of cycletrack option

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.

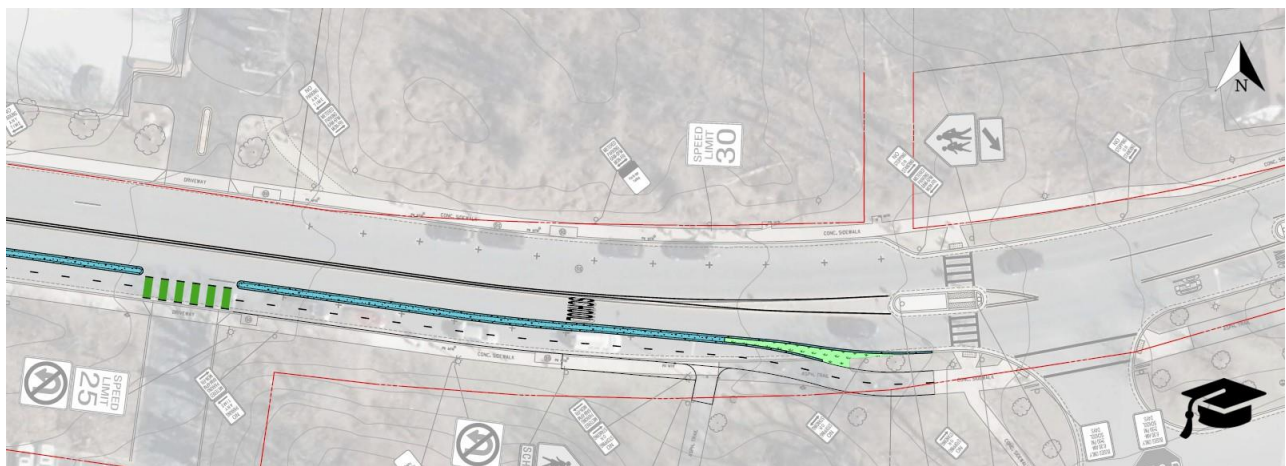


Figure 12: Eastern terminus of proposed cycletrack at RMHS



Driveway crossings are marked with green bike crosswalks. Similar to the bike path option, all metered spaces are proposed to be removed.

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).

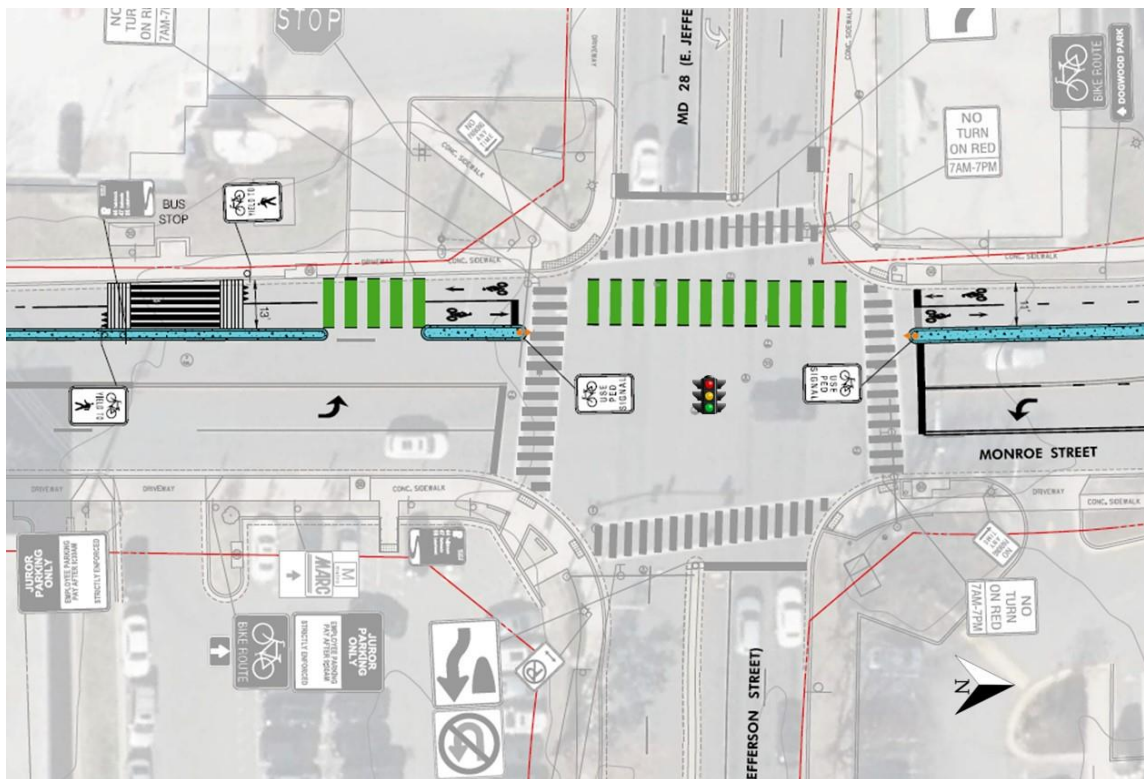


Figure 13: cycletrack concept crossing MD 28 (Jefferson Street)



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



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.¹ 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](#)

¹ 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.



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.



- 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.
- 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.

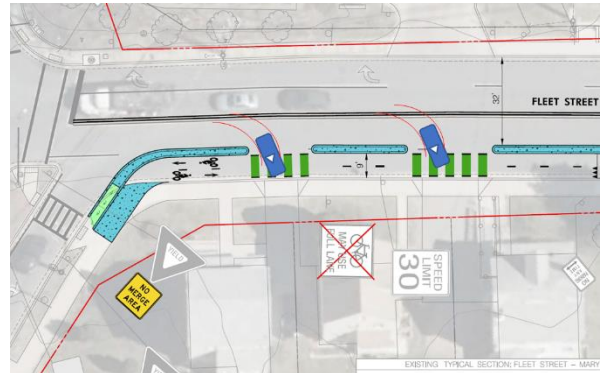


Figure 14: Vehicles backing up onto Fleet Street



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



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.

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



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.



Appendix A: Traffic counts

City of Rockville

Traffic & Transportation Division

File Name : MDave@FleetSt

Site Code : 00000028

Start Date : 10/6/2022

Page No : 1

Groups Printed- Unshifted

Start Time	NB Maryland Ave From North				WB Fleet St From East				SB Maryland Ave From South				City Hall Lower Parking Lot From West				Int. Total
	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	

City of Rockville

Traffic & Transportation Division

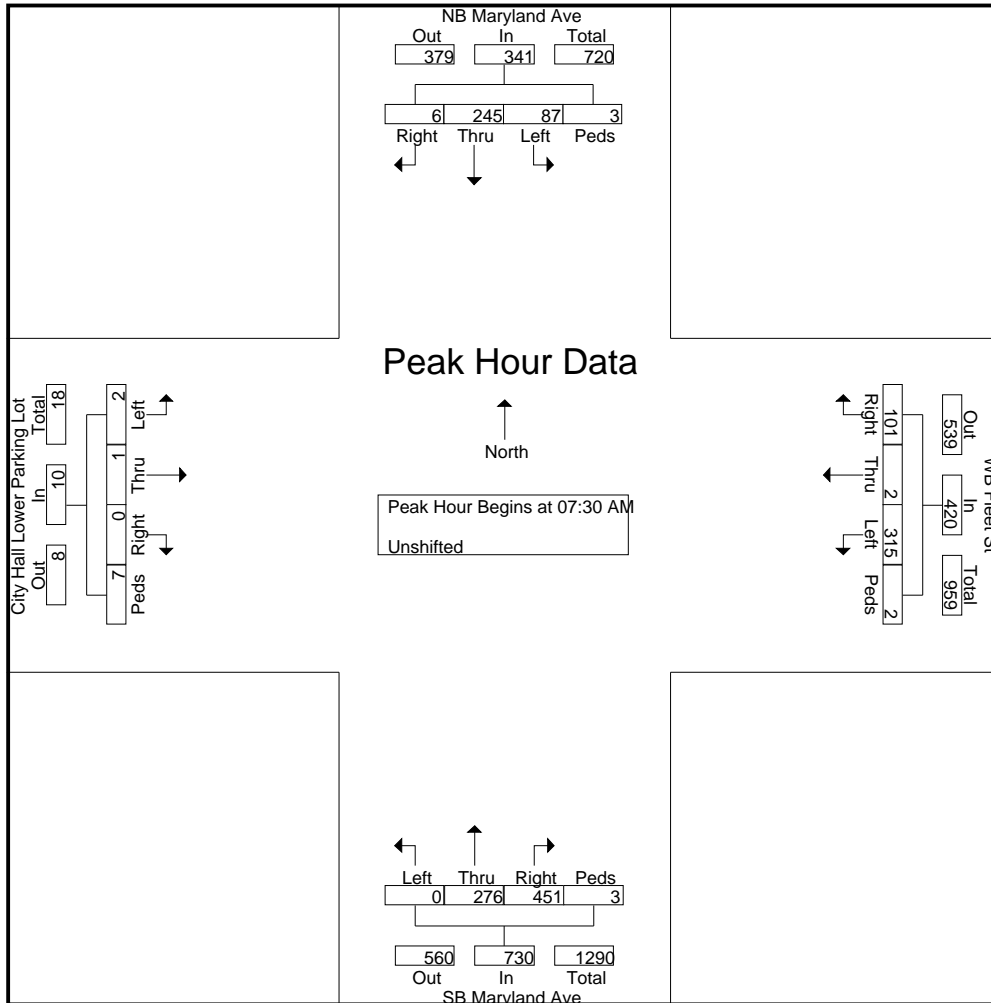
File Name : MDave@FleetSt

Site Code : 0000028

Start Date : 10/6/2022

Page No : 2

Start Time	NB Maryland Ave From North					WB Fleet St From East					SB Maryland Ave From South					City Hall Lower Parking Lot From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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



City of Rockville

Traffic & Transportation Division

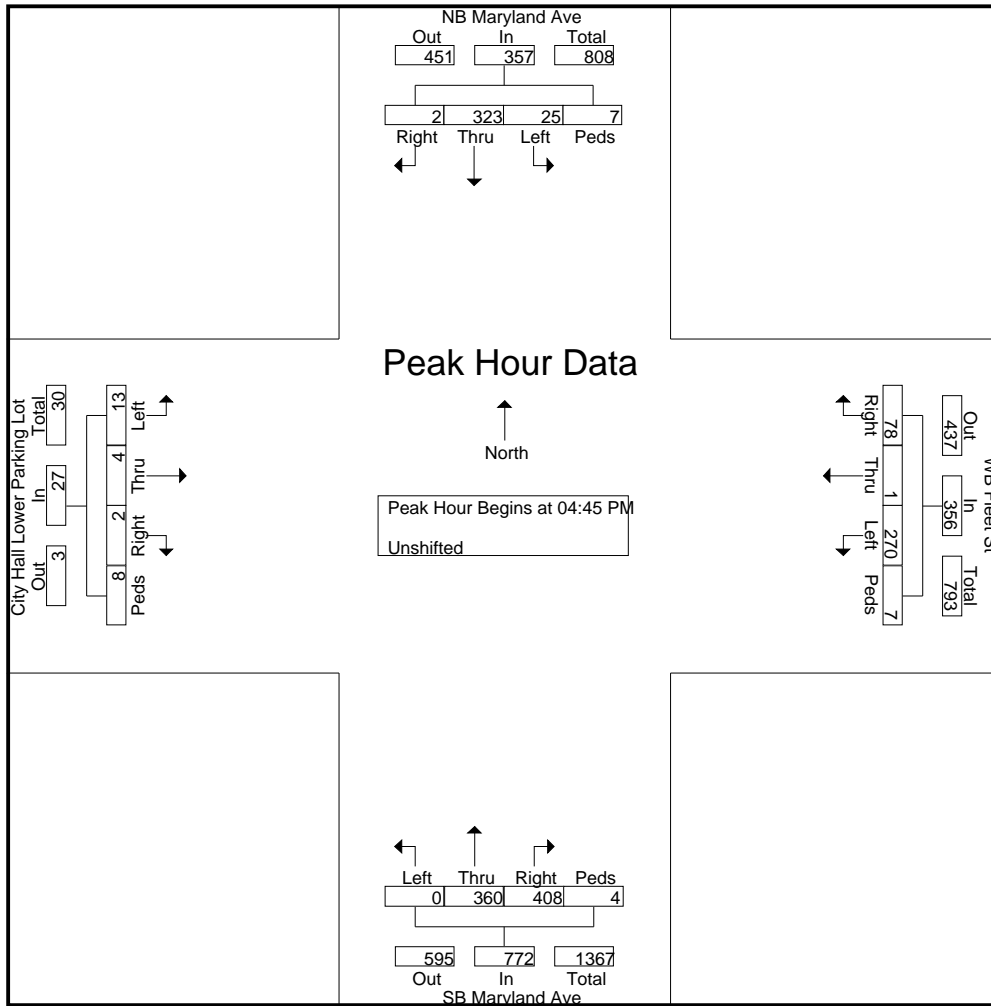
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	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 12:00 PM to 06:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins 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 0	.902	.250	.500	.650	.667	.750	.924



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

Start Time	SB Monroe St From North				WB Fleet St From East				NB Monroe St From South				EB Fleet St From West				Int. Total
	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	

City of Rockville

Traffic & Transportation Division

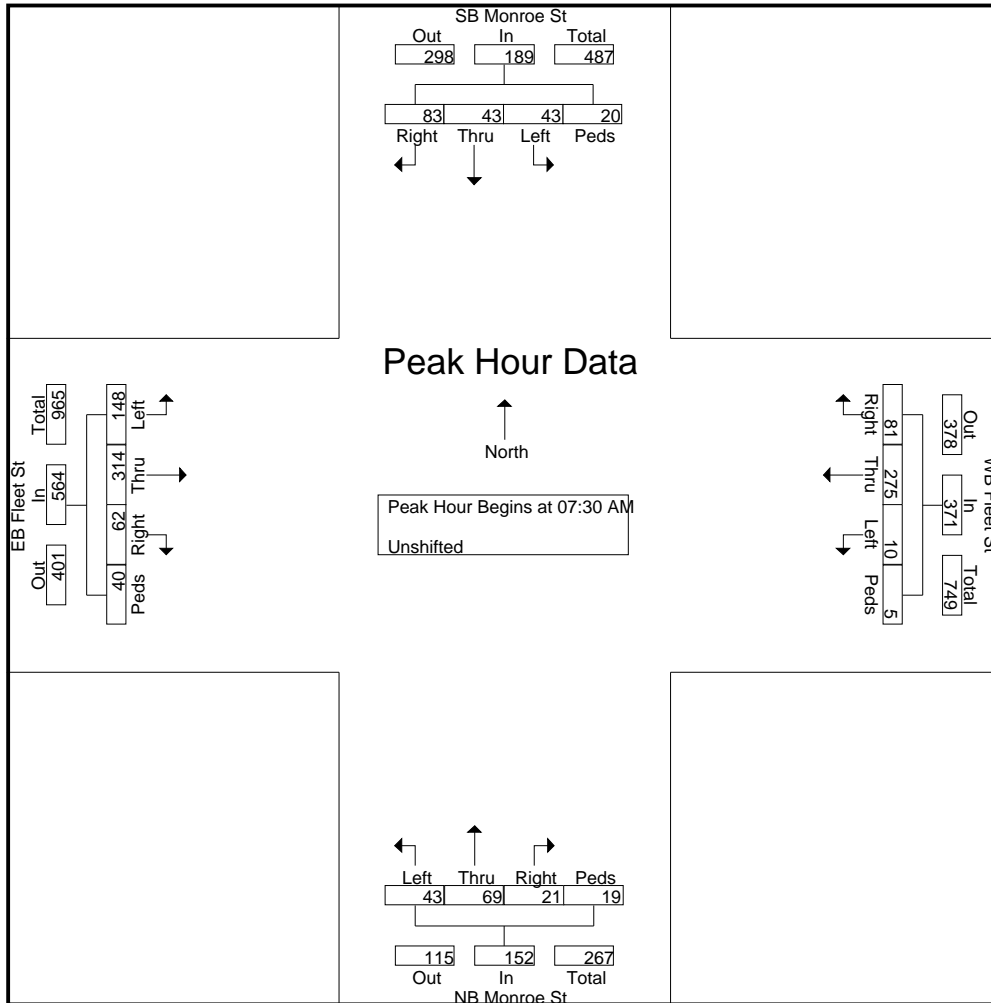
File Name : Monroe St@Fleet St

Site Code : 00000036

Start Date : 10/11/2022

Page No : 2

Start Time	SB Monroe St From North					WB Fleet St From East					NB Monroe St From South					EB Fleet St From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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



City of Rockville

Traffic & Transportation Division

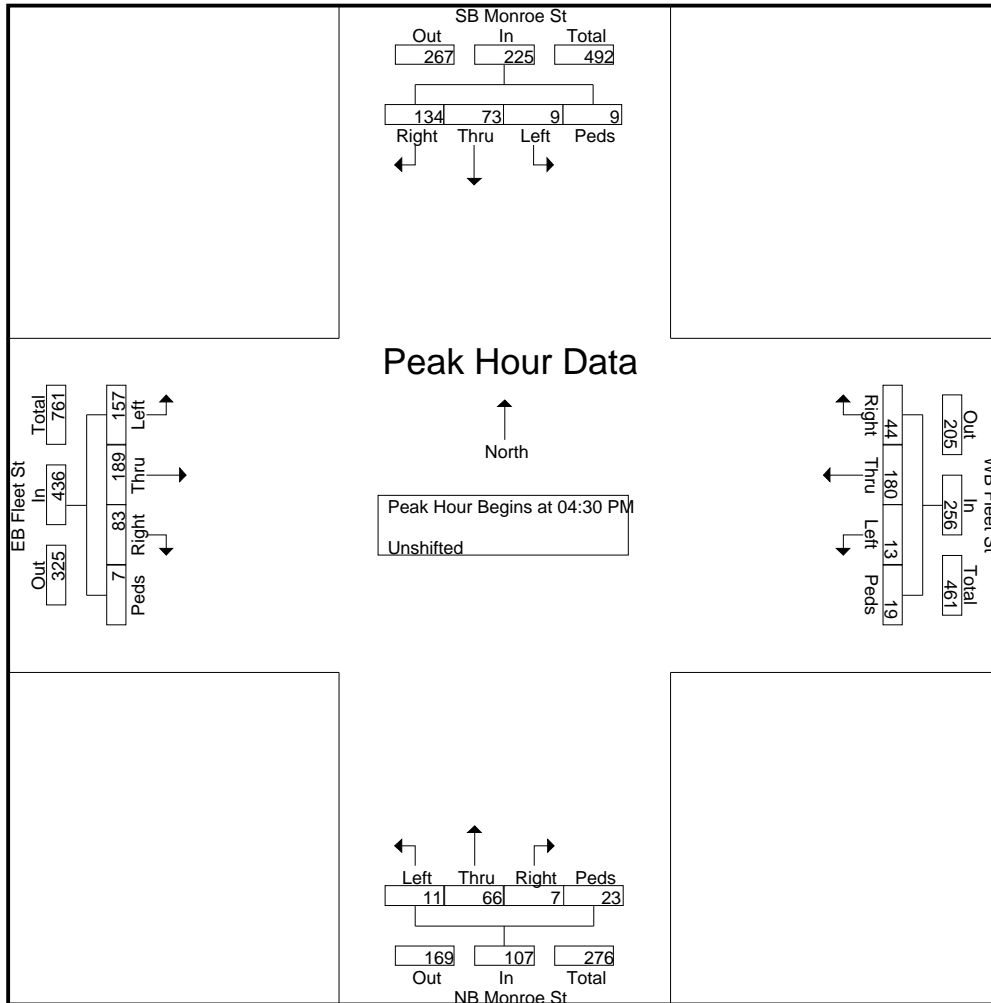
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Start Time	SB Monroe St From North					WB Fleet St From East					NB Monroe St From South					EB Fleet St From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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



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 From North					MD 586 From East					MD 355 From South					MD 28 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

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

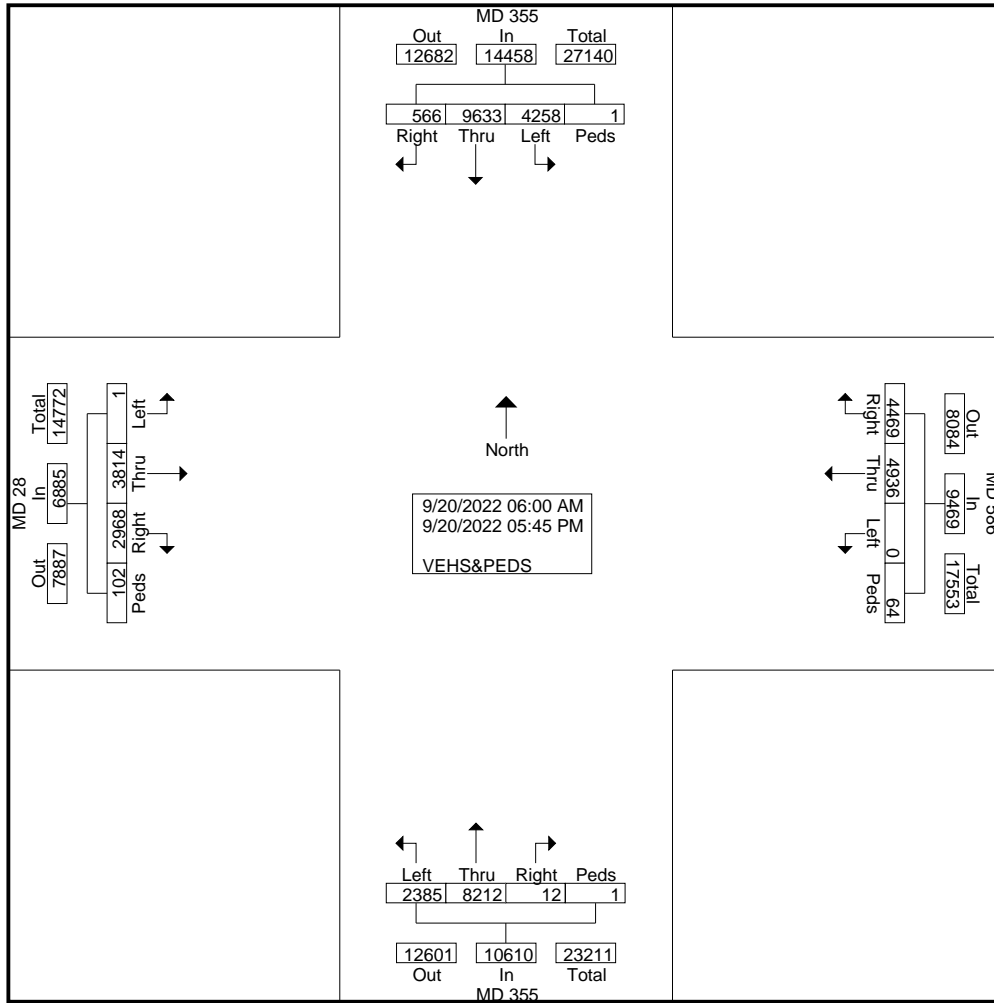
Groups Printed- VEHS&PEDS

Start Time	MD 355 From North					MD 586 From East					MD 355 From South					MD 28 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	
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	

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

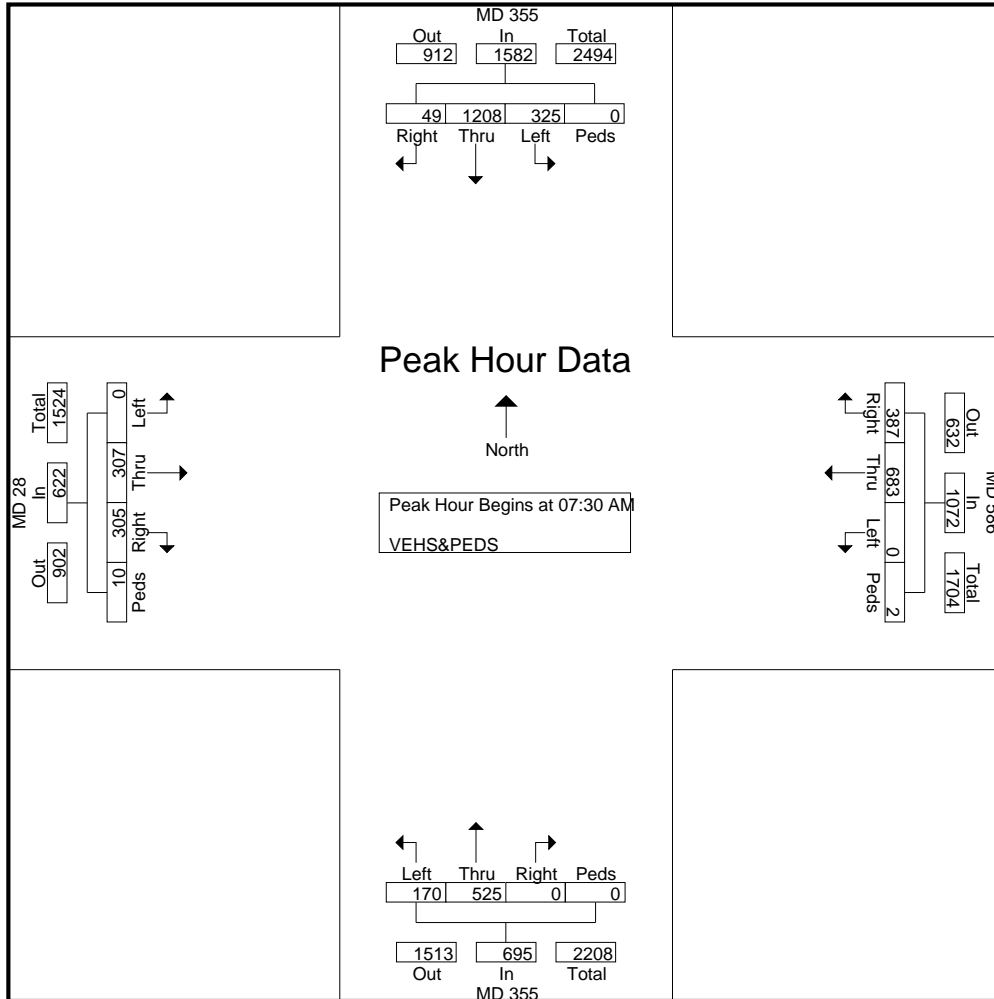


MEAD & HUNT

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

Start Time	MD 355 From North					MD 586 From East					MD 355 From South					MD 28 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	
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



MEAD & HUNT

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

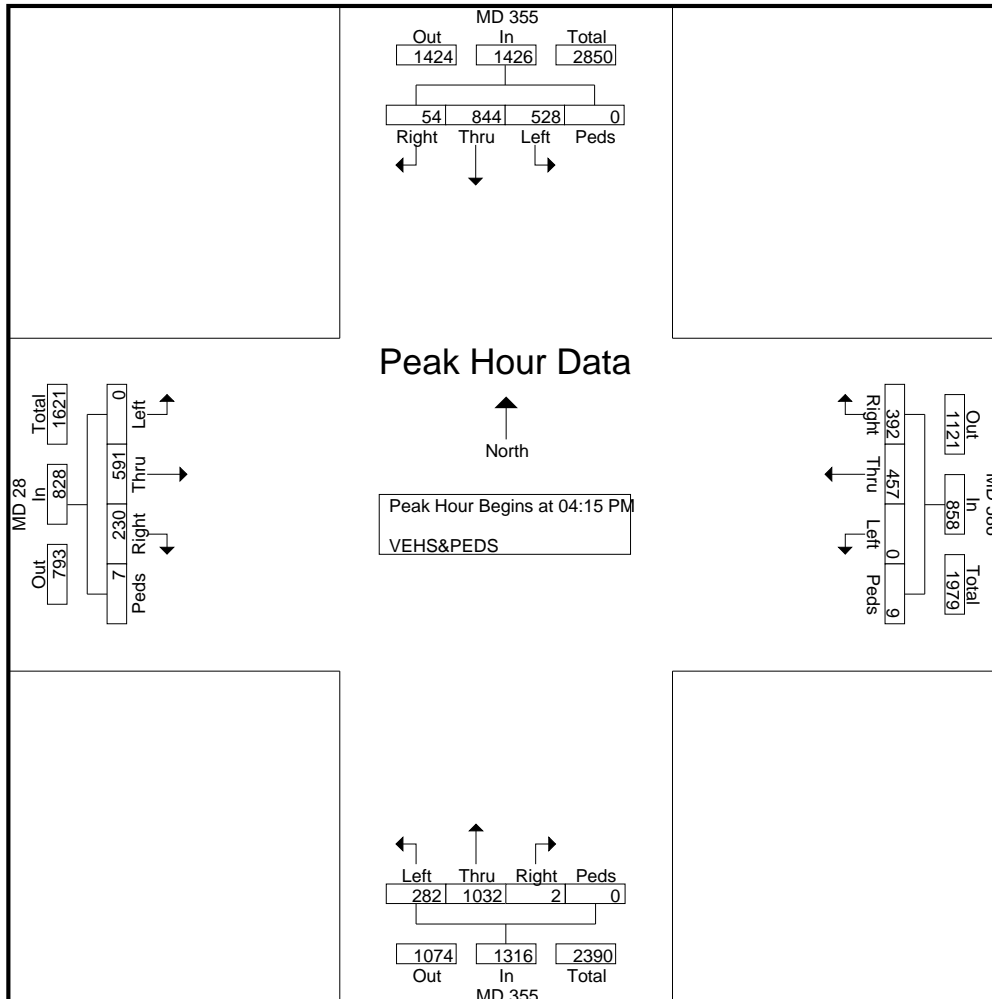
File Name : MD 355 AT MD 28-MD 586
Site Code : 00000000
Start Date : 9/20/2022
Page No : 5

Start Time	MD 355 From North					MD 586 From East					MD 355 From South					MD 28 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	

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

Start Time	MD 355 From North					MD 586 From East					MD 355 From South					MD 28 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	
*** 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	0	0	100	0	0	0	100	100	0	0	0	100	
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	

MEAD & HUNT

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

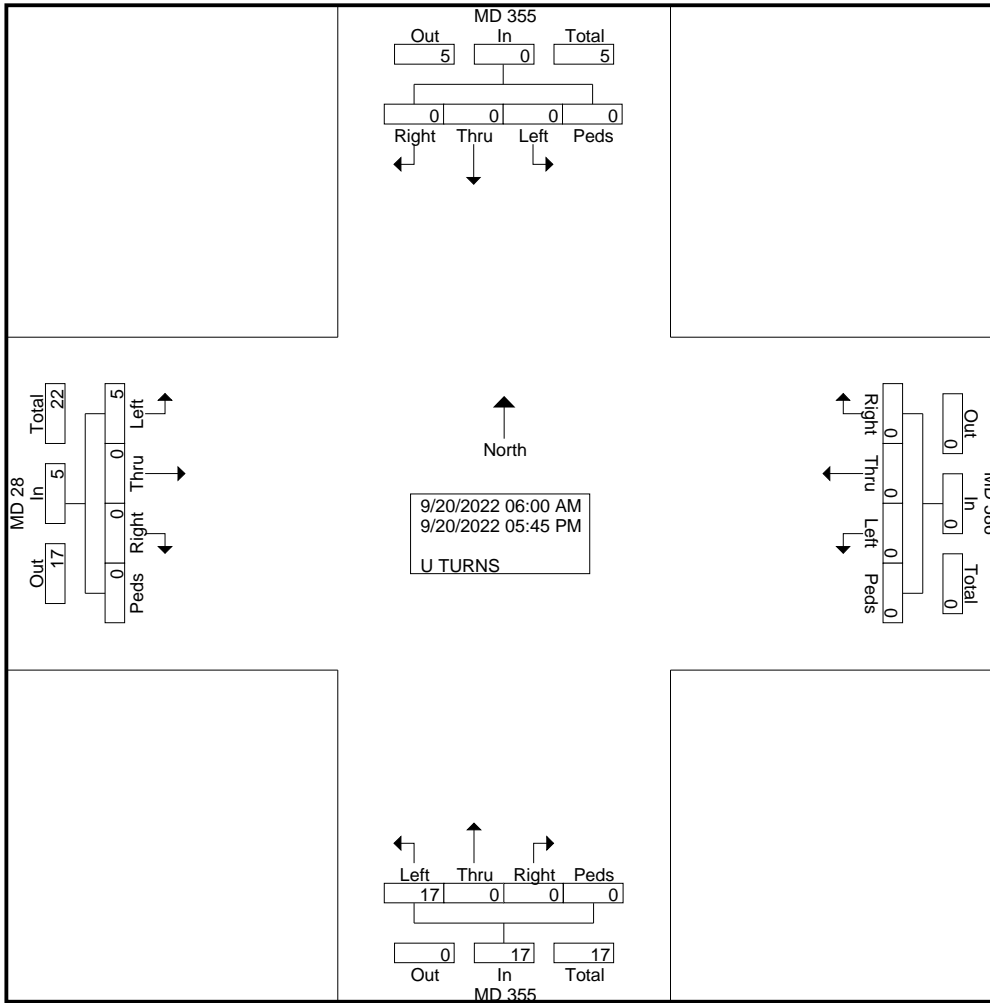
443-741-3500

File Name : MD 355 AT MD 28-MD 586

Site Code : 00000000

Start Date : 9/20/2022

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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

Start Time	MD 355 From North					MD 586 From East					MD 355 From South					MD 28 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	0	0	0	0	0	0	0	0	1	1	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	1	0	0	0	1
06:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	1	0	0	1	0	0	0	2	2	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
*** BREAK ***																					
07:30 AM	0	1	0	0	1	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	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
08:30 AM	0	1	0	0	1	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	1
Total	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	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
09:15 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	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	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	3
10:45 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	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
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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
*** 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
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	1
Total	1	0	0	0	1	0	0	0	1	1	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	1
*** BREAK ***																					
Total	0	1	0	0	1	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	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

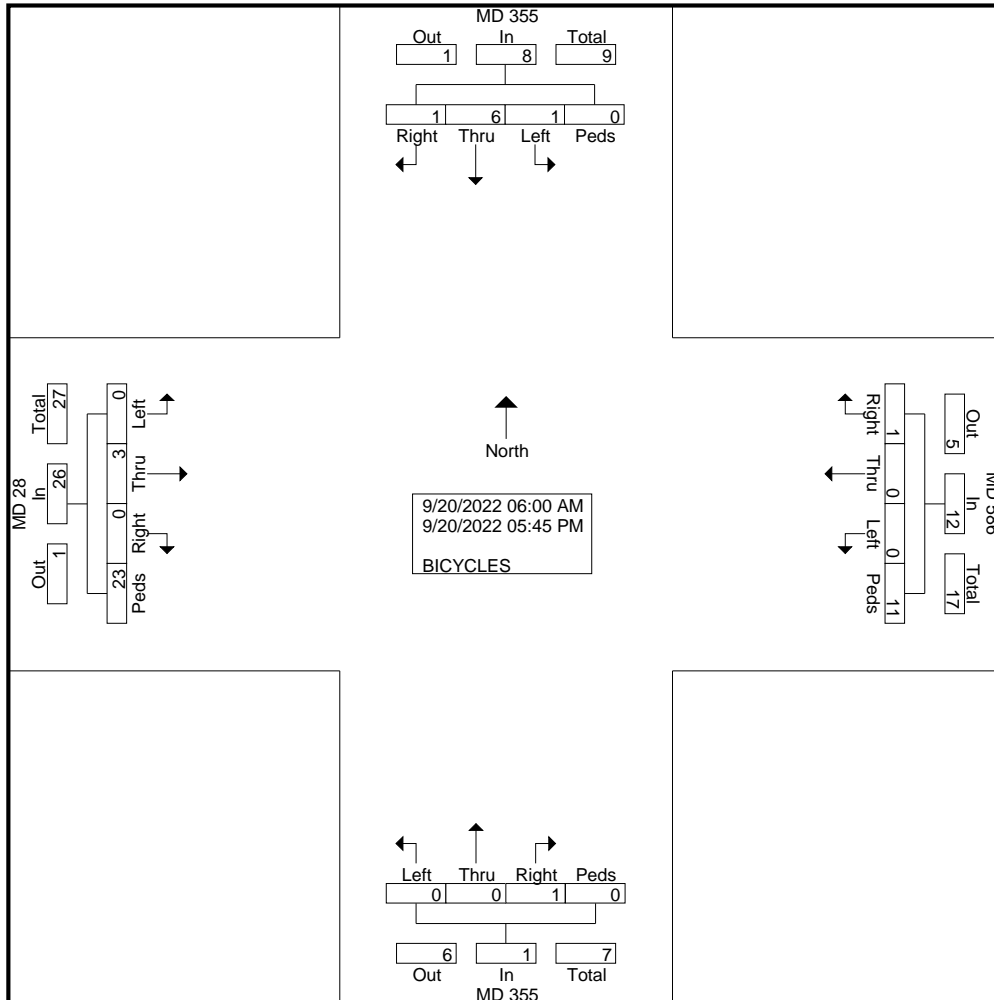
MEAD & HUNT

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

Start Time	MD 355 From North					MD 586 From East					MD 355 From South					MD 28 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	
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	



MEAD & HUNT

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

443-741-3500

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 From North					JEFFERSON ST From East					MONROE ST From South					JEFFERSON ST 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

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
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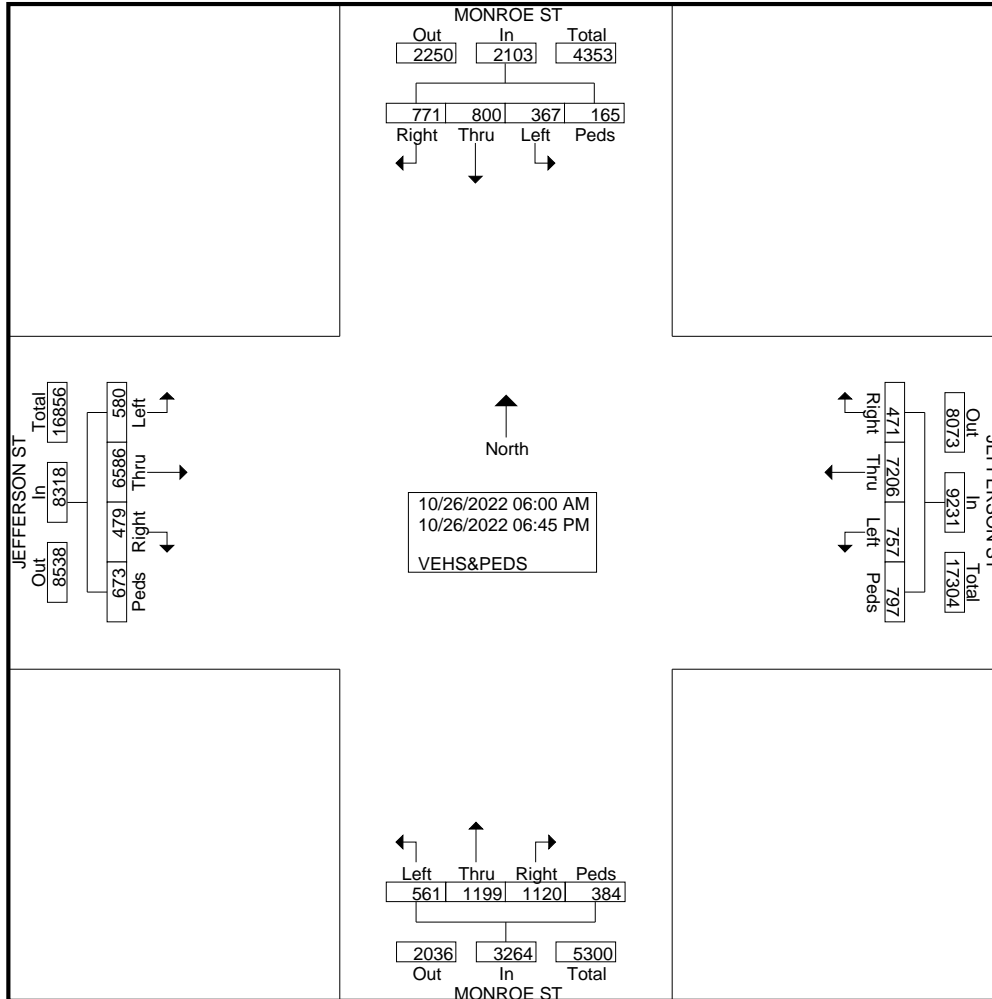
Groups Printed- VEHS&PEDS

Start Time	MONROE ST From North					JEFFERSON ST From East					MONROE ST From South					JEFFERSON ST 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	
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	

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



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
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	MONROE ST From North					JEFFERSON ST From East					MONROE ST From South					JEFFERSON ST 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

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

Start Time	MONROE ST From North					JEFFERSON ST From East					MONROE ST From South					JEFFERSON ST 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	
*** 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	

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
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Page No : 1

Groups Printed- BICYCLES

Start Time	MONROE ST From North					JEFFERSON ST From East					MONROE ST From South					JEFFERSON ST 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	
*** BREAK ***																					
06:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** 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

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7055 Samuel Morse Drive Suite 100
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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

Start Time	MONROE ST From North					JEFFERSON ST From East					MONROE ST From South					JEFFERSON ST 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 PM	0	2	0	0	2	0	0	0	1	1	0	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	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	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	0	1
Total	0	3	0	0	3	0	0	0	2	2	0	2	1	0	3	0	1	0	0	1	1	9
Grand Total	0	7	1	0	8	0	1	0	11	12	0	11	1	3	15	0	2	0	2	4	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		

Mead & Hunt

7055 Samuel Morse Drive Suite 100
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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 From East				MONROE ST From South				MIDDLE LN 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

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File Name : MONROE ST AT MIDDLE LN
Site Code : 00000000
Start Date : 10/26/2022
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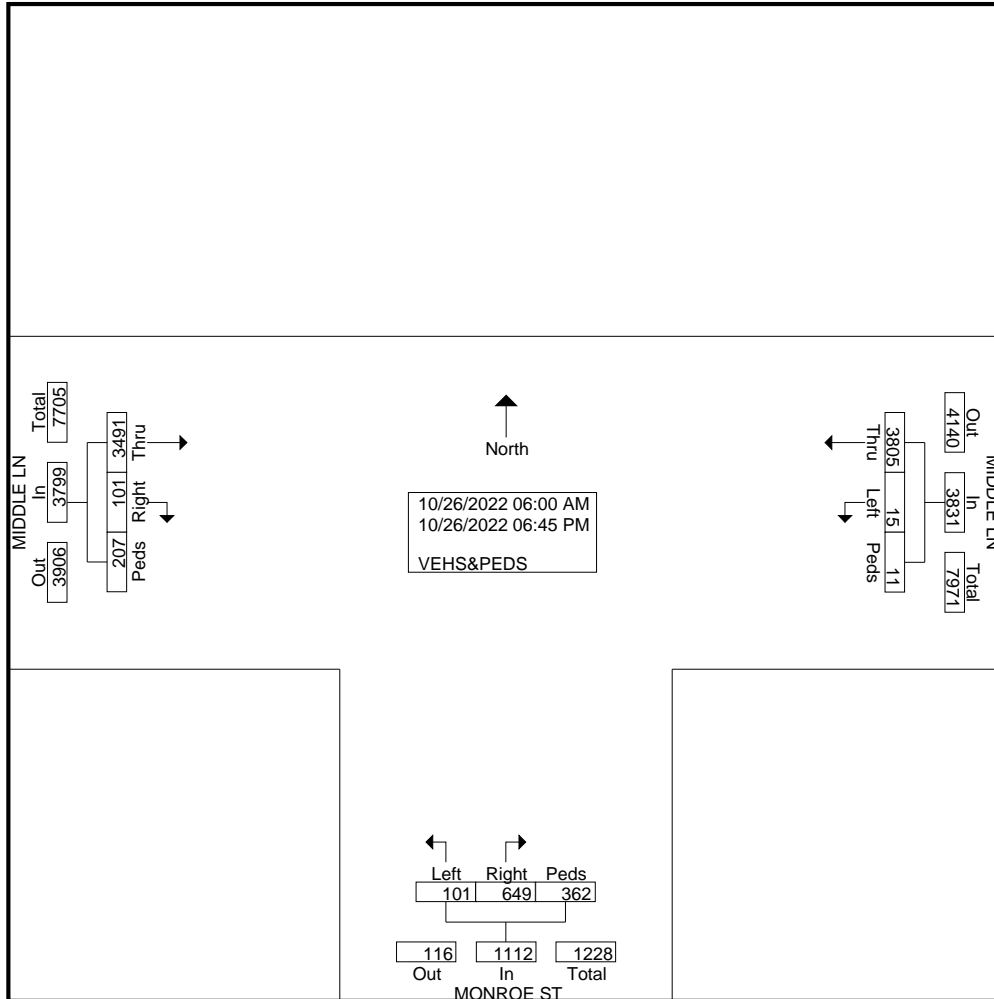
Groups Printed- VEHS&PEDS

Start Time	MIDDLE LN From East				MONROE ST From South				MIDDLE LN From West				Int. Total
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. 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	

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

Start Time	MIDDLE LN From East				MONROE ST From South				MIDDLE LN From West				Int. Total
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	

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

Mead & Hunt

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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

Start Time	MIDDLE LN From East				MONROE ST From South				MIDDLE LN From West				Int. Total	
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total		
*** BREAK ***														
07:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	1
*** BREAK ***														
Total	1	0	0	1	0	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	0	1
01:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	1
*** BREAK ***														
01:45 PM	1	0	0	1	1	0	0	1	1	0	0	1	1	3
Total	1	0	0	1	2	0	0	2	2	0	0	2	2	5
*** BREAK ***														
02:30 PM	0	0	0	0	1	0	0	1	1	0	0	1	1	2
*** BREAK ***														
Total	0	0	0	0	1	0	0	1	1	0	0	1	1	2
*** BREAK ***														
03:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	1
*** BREAK ***														
03:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	1
03:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	1
Total	0	0	0	0	0	0	0	0	3	0	0	3	3	3
*** BREAK ***														
04:30 PM	0	0	0	0	1	0	0	1	1	0	0	1	1	2
*** BREAK ***														
Total	0	0	0	0	1	0	0	1	1	0	0	1	1	2
*** BREAK ***														
05:15 PM	0	0	0	0	0	0	0	0	2	0	0	2	2	2
05:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	1
05:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	1
Total	0	0	0	0	0	0	0	0	4	0	0	4	4	4
*** BREAK ***														
Grand Total	2	0	0	2	4	0	0	4	11	0	0	11	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		

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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 From East				MONROE ST From South				MIDDLE LN 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

Mead & Hunt

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

Groups Printed- BICYCLES

Start Time	MIDDLE LN From East				MONROE ST From South				MIDDLE LN From West				Int. Total
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. 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	



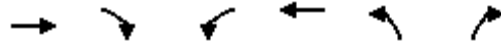
Appendix B: HCM Reports

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

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	
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			21.5%	ICU Level of Service	A	
Analysis Period (min)			15			

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 Analysis

3: Monroe St & Monroe Pl























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									

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		
Intersection Summary													
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													

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
Frbp, 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	

Intersection Summary		
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.59	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	69.4%	10.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM Signalized Intersection Capacity Analysis

6: Maryland Ave & 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	
Frbp, 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

Intersection Summary			
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			

HCM Signalized Intersection Capacity Analysis

7: MD 355 & E Jefferson St

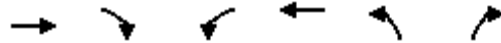
04/14/2023

														
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			
Frbp, 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			
Intersection Summary														
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								26.0			
Intersection Capacity Utilization			75.2%										ICU Level of Service	D
Analysis Period (min)			15											
c	Critical Lane Group													

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			

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 Analysis

3: Monroe St & Monroe Pl























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									

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)	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	
Intersection Summary													
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													

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
Frbp, 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	

Intersection Summary		
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.48	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	68.7%	10.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM Signalized Intersection Capacity Analysis

6: Maryland Ave & 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	
Frbp, 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			

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	
Frbp, 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	
Intersection Summary												
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 & 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 & 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 & 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 & 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 & 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 & 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 & 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 & 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 & 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 & 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

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
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			21.5%	ICU Level of Service	A	
Analysis Period (min)			15			

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 Analysis

3: Monroe St & Monroe Pl





















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									

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		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	
Intersection Summary												
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												

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	
Frbp, 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	

Intersection Summary		
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.59	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	85.6%	10.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

HCM Signalized Intersection Capacity Analysis

6: Maryland Ave & 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	
Frbp, 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
Intersection Summary												
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												

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		
Frbp, 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		
Intersection Summary													
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												

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			

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 Analysis

3: Monroe St & Monroe Pl

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									

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)	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	

Intersection Summary

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			

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	

Intersection Summary		
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.54	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	70.3%	10.0
Analysis Period (min)	15	ICU Level of Service
		C
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

6: Maryland Ave & 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		
Frbp, 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	
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													

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		
Frbp, 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		
Intersection Summary													
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 & 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 & 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
Build Conditions

04/14/2023

Intersection: 4: Monroe St & 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 & 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 & 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 & 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 & 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 & 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 & 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 PI

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: 4: Monroe St & 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 & 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 & 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 & 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 & 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

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
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			21.5%	ICU Level of Service	A	
Analysis Period (min)			15			

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 Analysis

3: Monroe St & Monroe Pl





















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									

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		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	
Intersection Summary												
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												

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	
Frbp, 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	





















Intersection Summary

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			

HCM Signalized Intersection Capacity Analysis

6: Maryland Ave & 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	
Frbp, 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
Intersection Summary												
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												

HCM Signalized Intersection Capacity Analysis

7: MD 355 & E Jefferson St

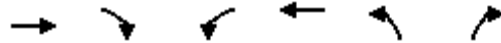
04/14/2023

													
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		
Frbp, 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		
Intersection Summary													
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												

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			

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 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									

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)	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	

Intersection Summary			
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			

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	





















Intersection Summary

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	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			

HCM Signalized Intersection Capacity Analysis

6: Maryland Ave & 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		
Frbp, 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													

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		
Frbp, 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		
Intersection Summary													
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 & 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 & 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 PI

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 & 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 & 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 & 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 & 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 & 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 & 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 & 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 PI

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 & 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 & 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 & 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 & 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 & 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

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	
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			21.5%	ICU Level of Service	A	
Analysis Period (min)			15			

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 Analysis

3: Monroe St & Monroe Pl


























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									

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	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		
Intersection Summary													
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													

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	
Frbp, 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	





















Intersection Summary

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			

HCM Signalized Intersection Capacity Analysis

6: Maryland Ave & 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	
Frbp, 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
Intersection Summary												
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											

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		
Frbp, 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		
Intersection Summary													
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													

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			

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 Analysis

3: Monroe St & Monroe Pl

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									

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)	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	
Intersection Summary													
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													

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	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	

Intersection Summary			
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			

HCM Signalized Intersection Capacity Analysis

6: Maryland Ave & 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	
Frbp, 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												

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		
Frbp, 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		
Intersection Summary													
HCM 2000 Control Delay			67.3									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 & 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 & 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
Build Conditions

04/14/2023

Intersection: 4: Monroe St & 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 & 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 & 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 & 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 & 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 & 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 & 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 PI

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 & 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 & 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 & 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 & 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 & E Jefferson St

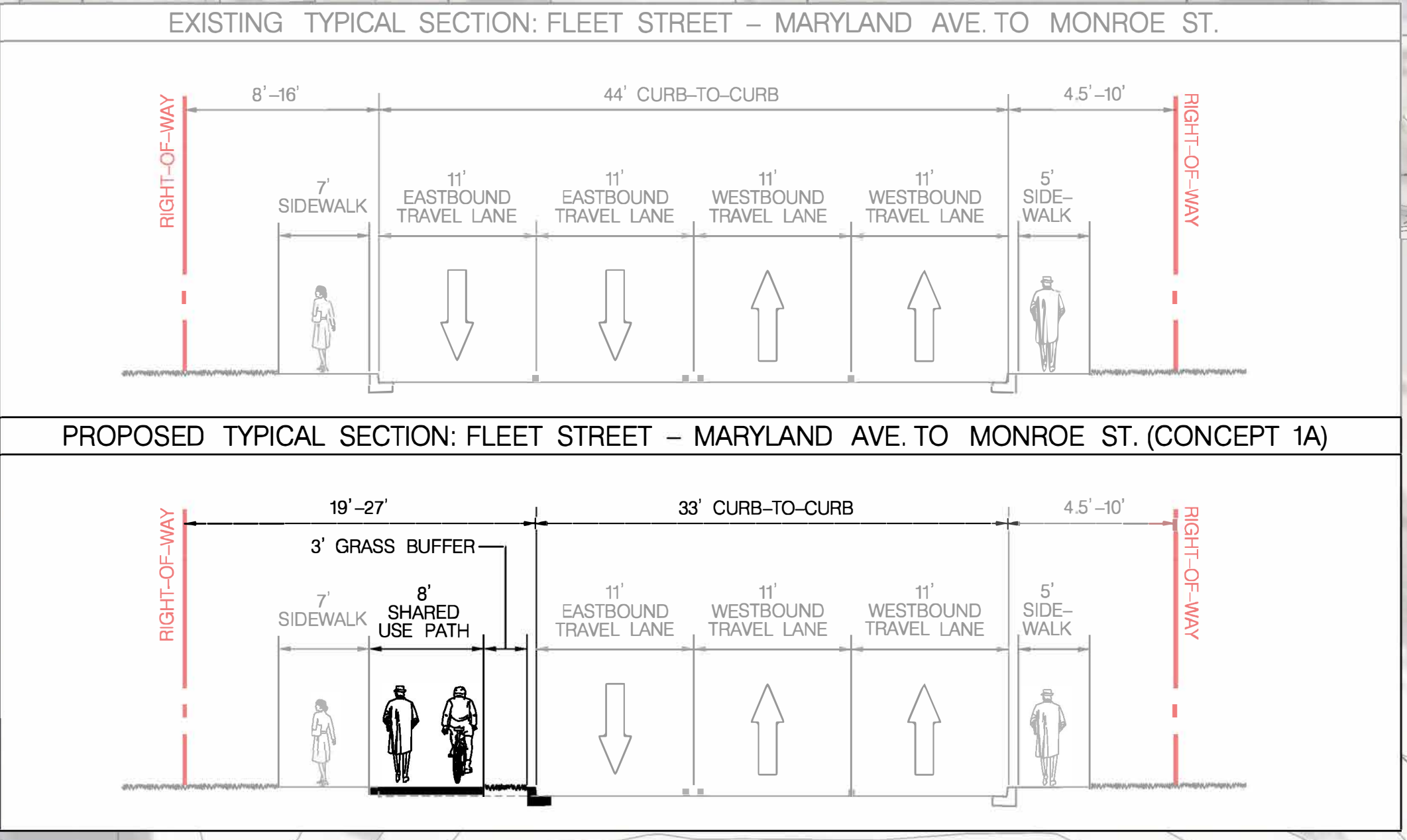
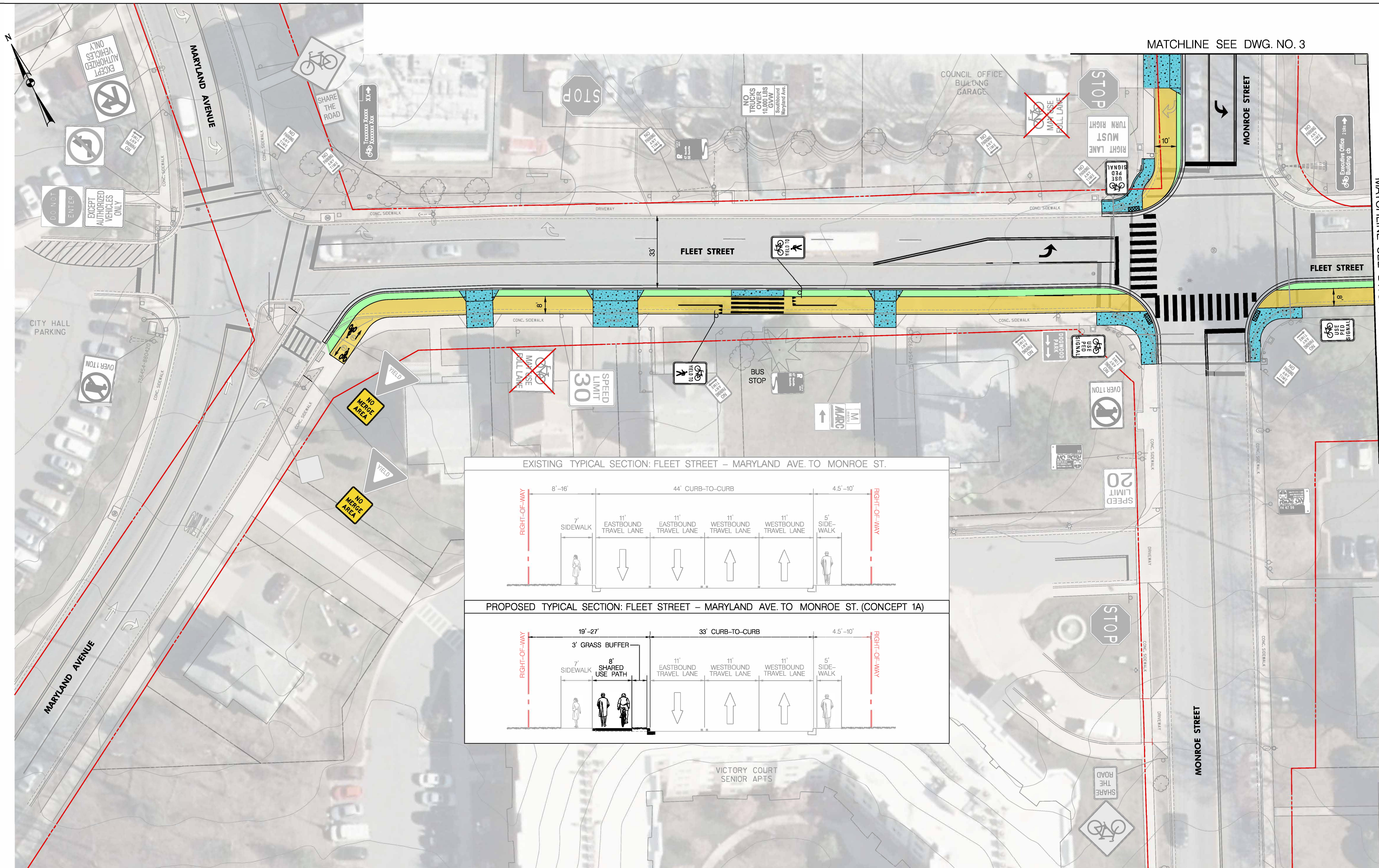
Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	704	652	452
Average Queue (ft)	628	422	256
95th Queue (ft)	858	706	414
Link Distance (ft)	658	658	658
Upstream Blk Time (%)	68	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)	1		
Queuing Penalty (veh)	5		

Network Summary

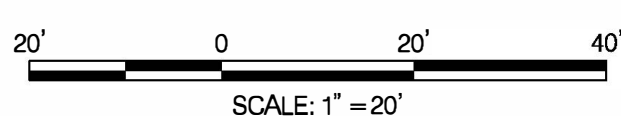
Network wide Queuing Penalty: 268



Appendix C: Conceptual Plans



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 DRAFTED C. KELLER
 CHECKED B. WHITE

DESIGN PLAN APPROVAL

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

AS BUILT PLAN APPROVAL

_____ CHIEF, CONSTRUCTION MANAGEMENT	APPROVAL DATE _____
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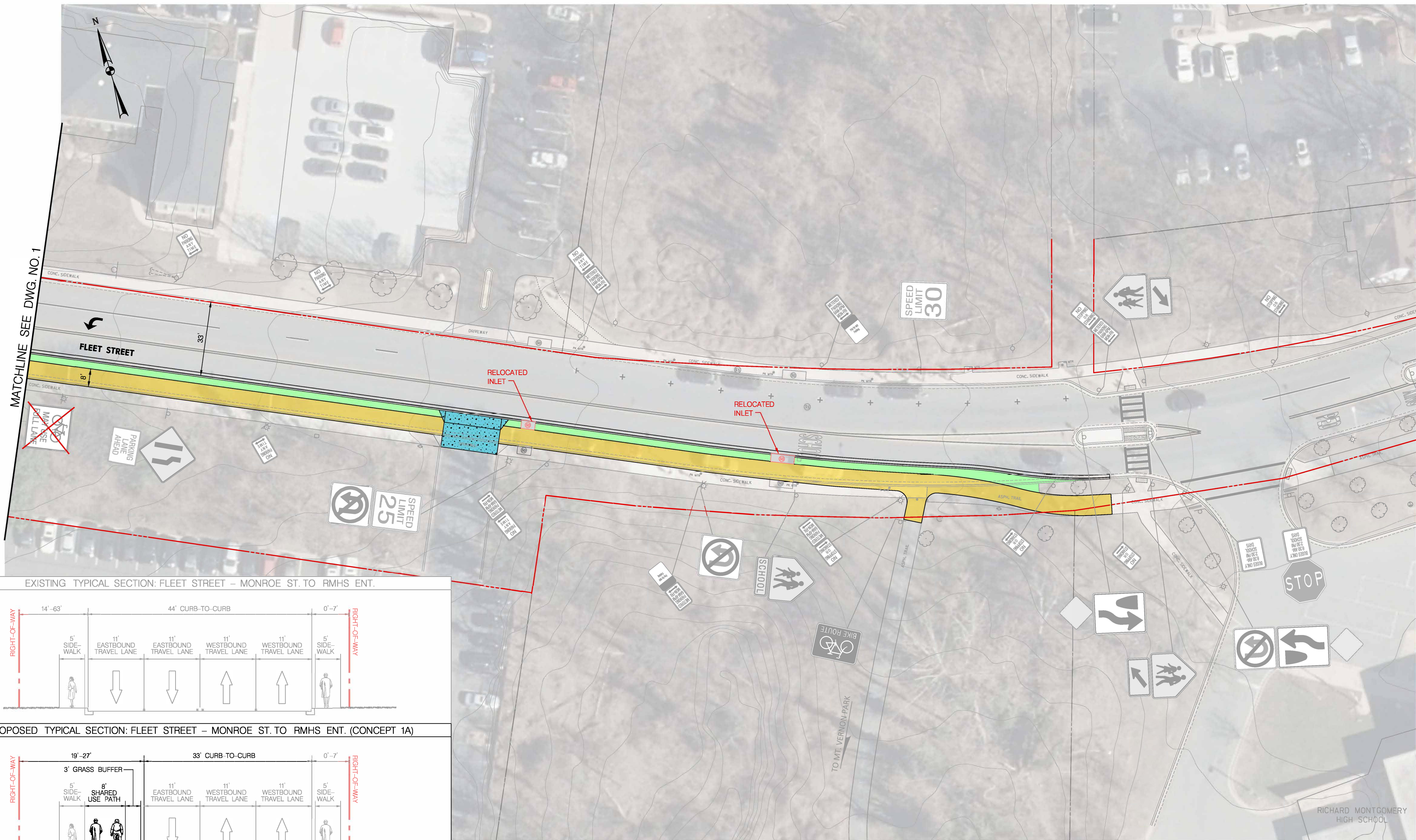
CONCEPT 1

MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET
 COMPLETE STREETS STUDY
 Election District No. 2 City of Rockville, Maryland

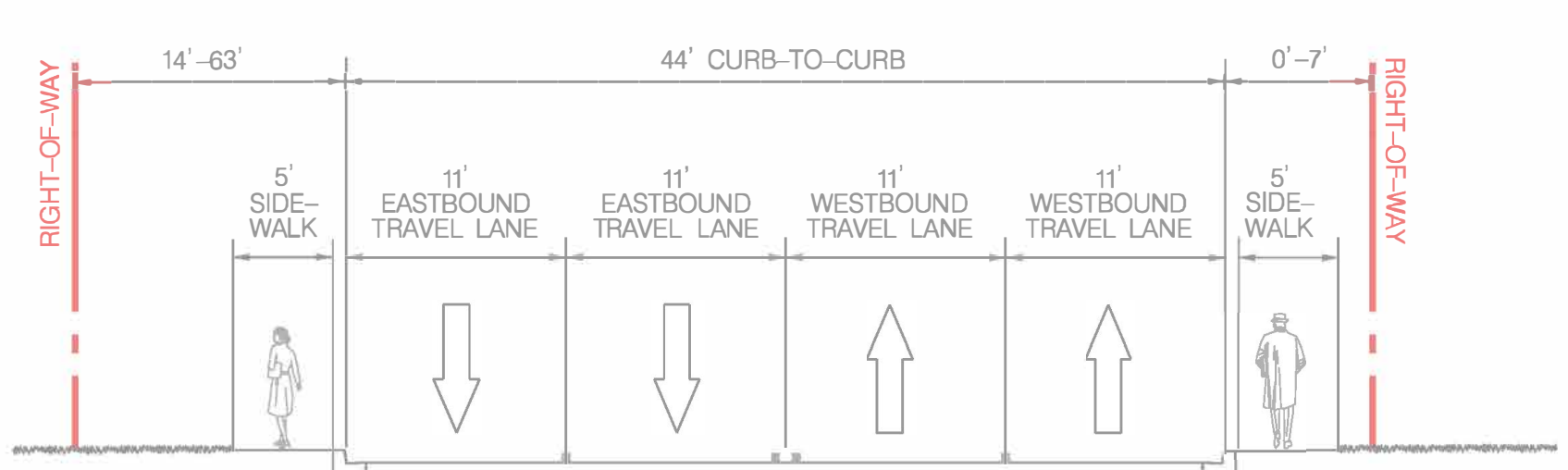
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APPROVAL OF REVISIONS AFTER INITIAL PLAN APPROVAL

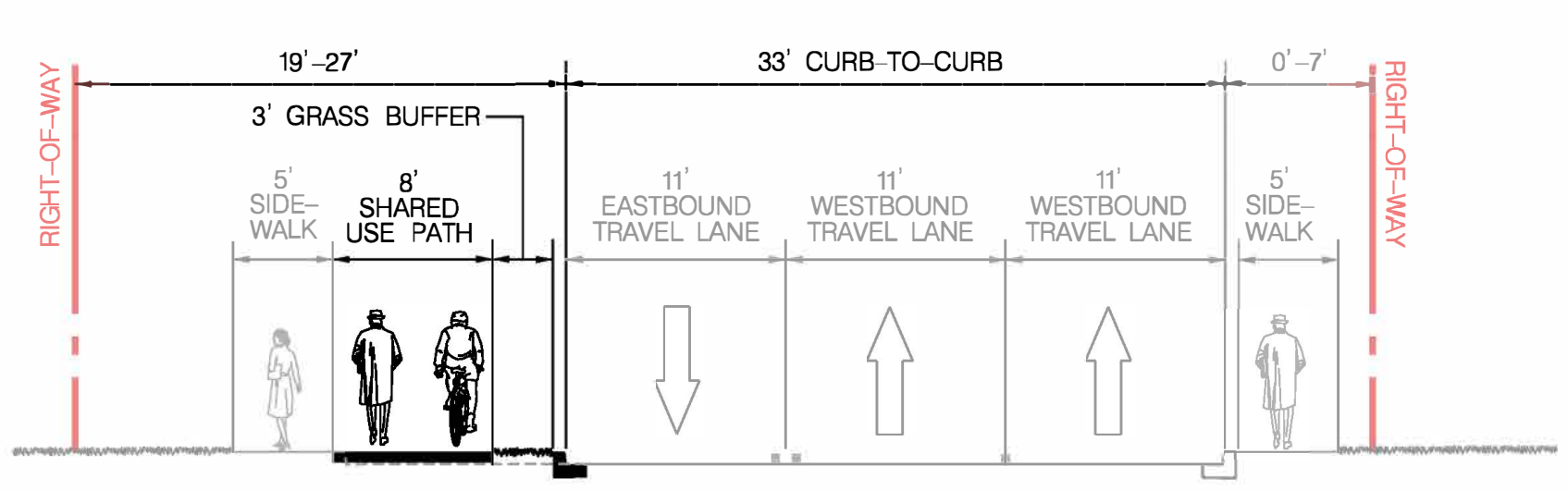
DATE SUBMITTED OCTOBER 2022	SCALE 1"=20'	SHEET NO. 1	FILE #
		OF 5	



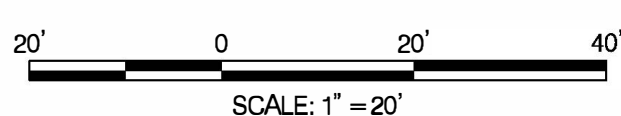
EXISTING TYPICAL SECTION: FLEET STREET - MONROE ST. TO RMHS ENT.



PROPOSED TYPICAL SECTION: FLEET STREET - MONROE ST. TO RMHS ENT. (CONCEPT 1A)



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MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET
 COMPLETE STREETS STUDY
 Election District No. 2 City of Rockville, Maryland

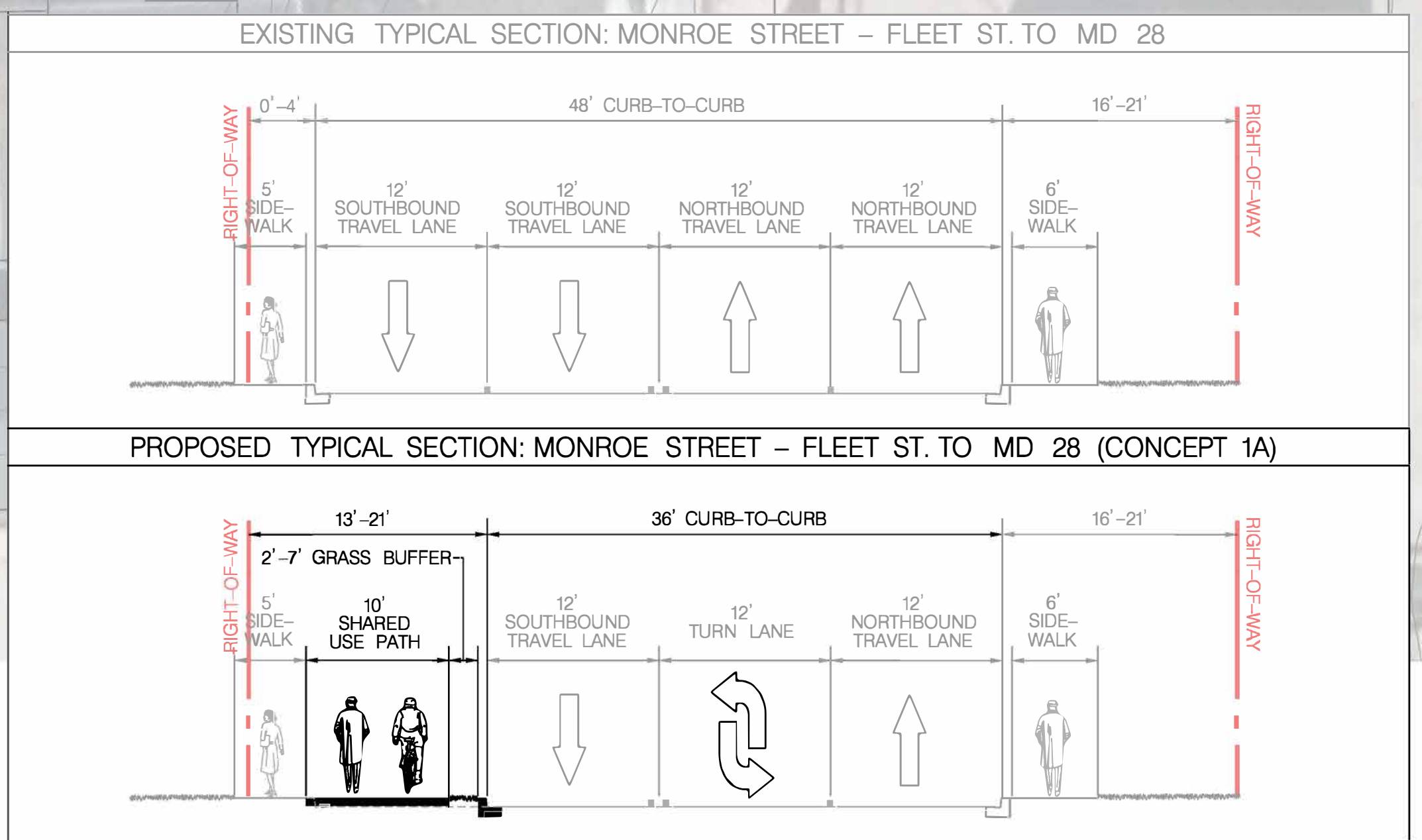
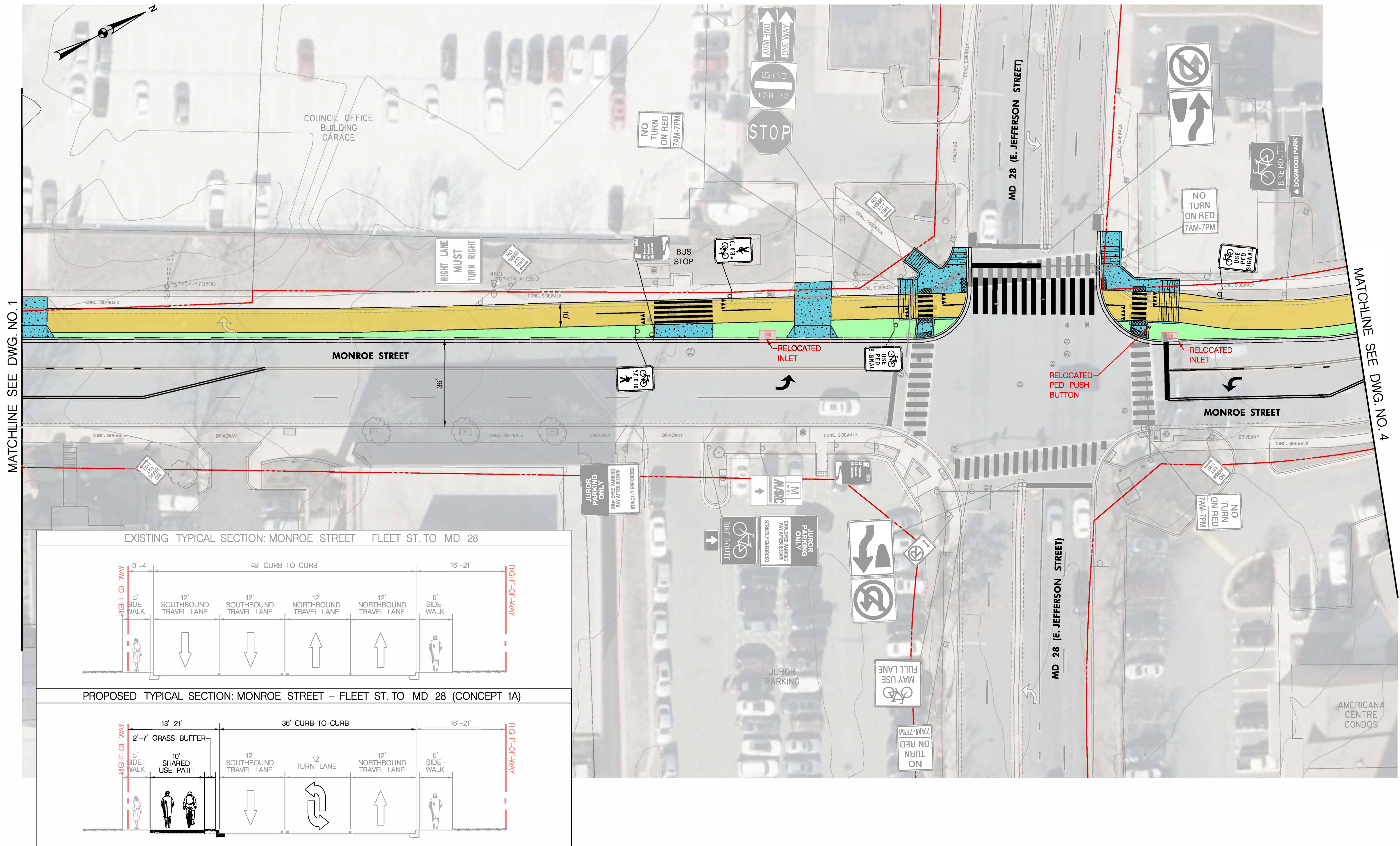
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DESCRIPTION OF REVISION	P.E. INITIAL	DATE	DPW	DATE

DATE SUBMITTED
 OCTOBER 2022

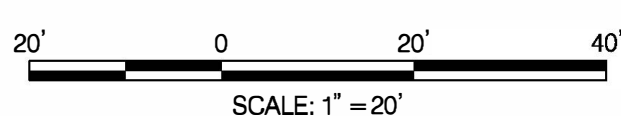
SCALE
 1"=20'

SHEET
 NO. 2
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FILE #



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	SMP* _____ REVIEWED BY _____
DIRECTOR OF PUBLIC WORKS	APPROVAL DATE _____

AS BUILT PLAN APPROVAL

	CHIEF, CONSTRUCTION MANAGEMENT
	APPROVAL DATE _____

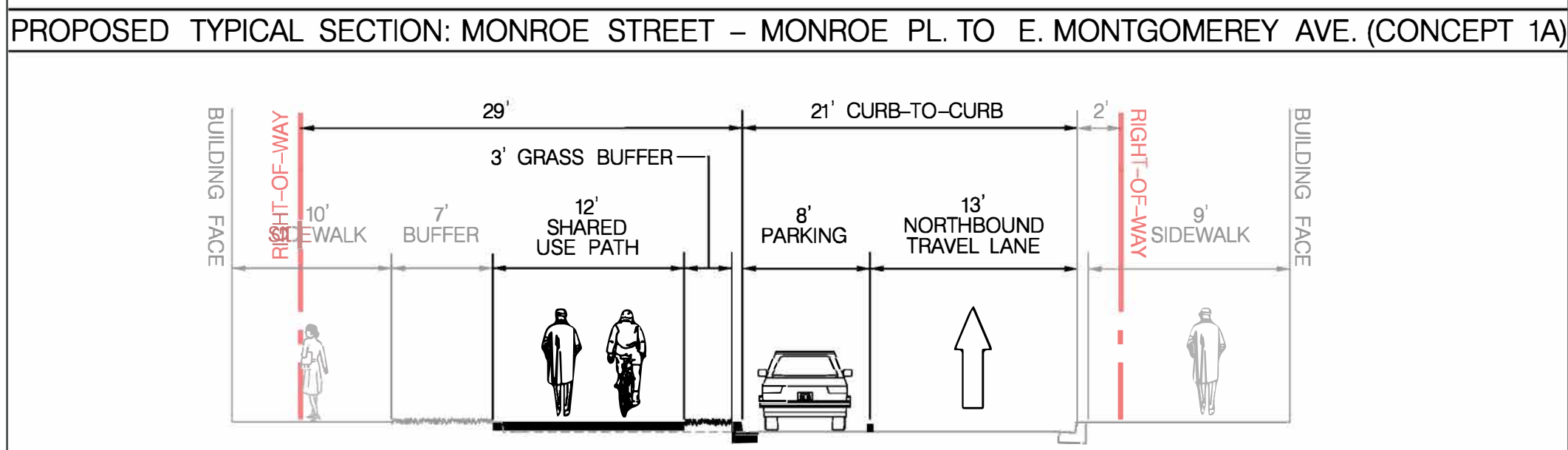
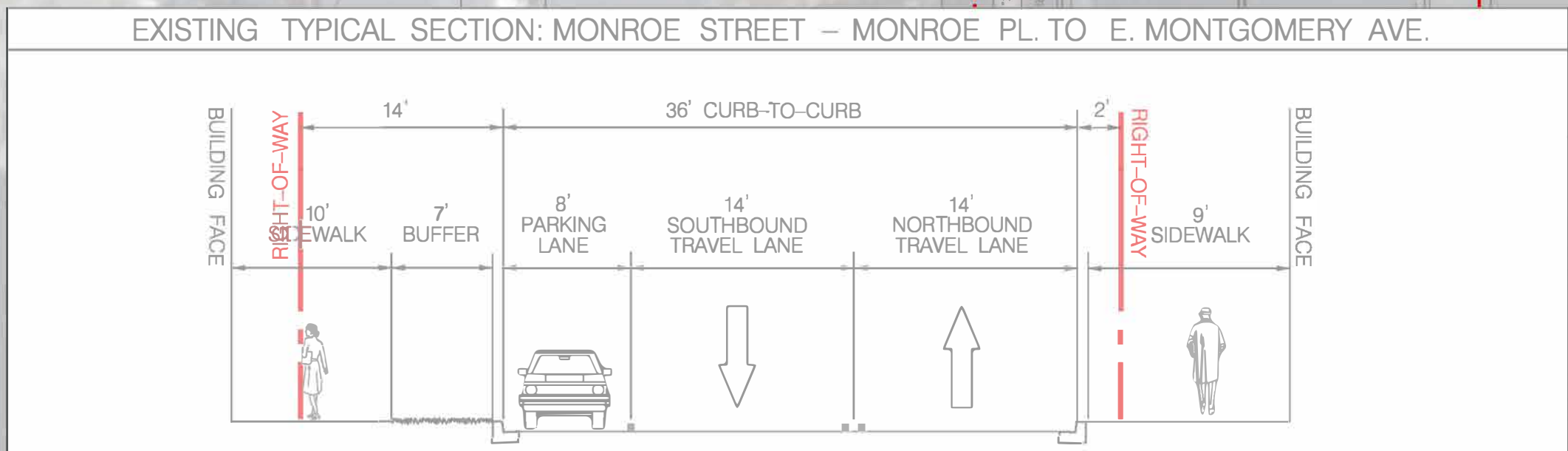
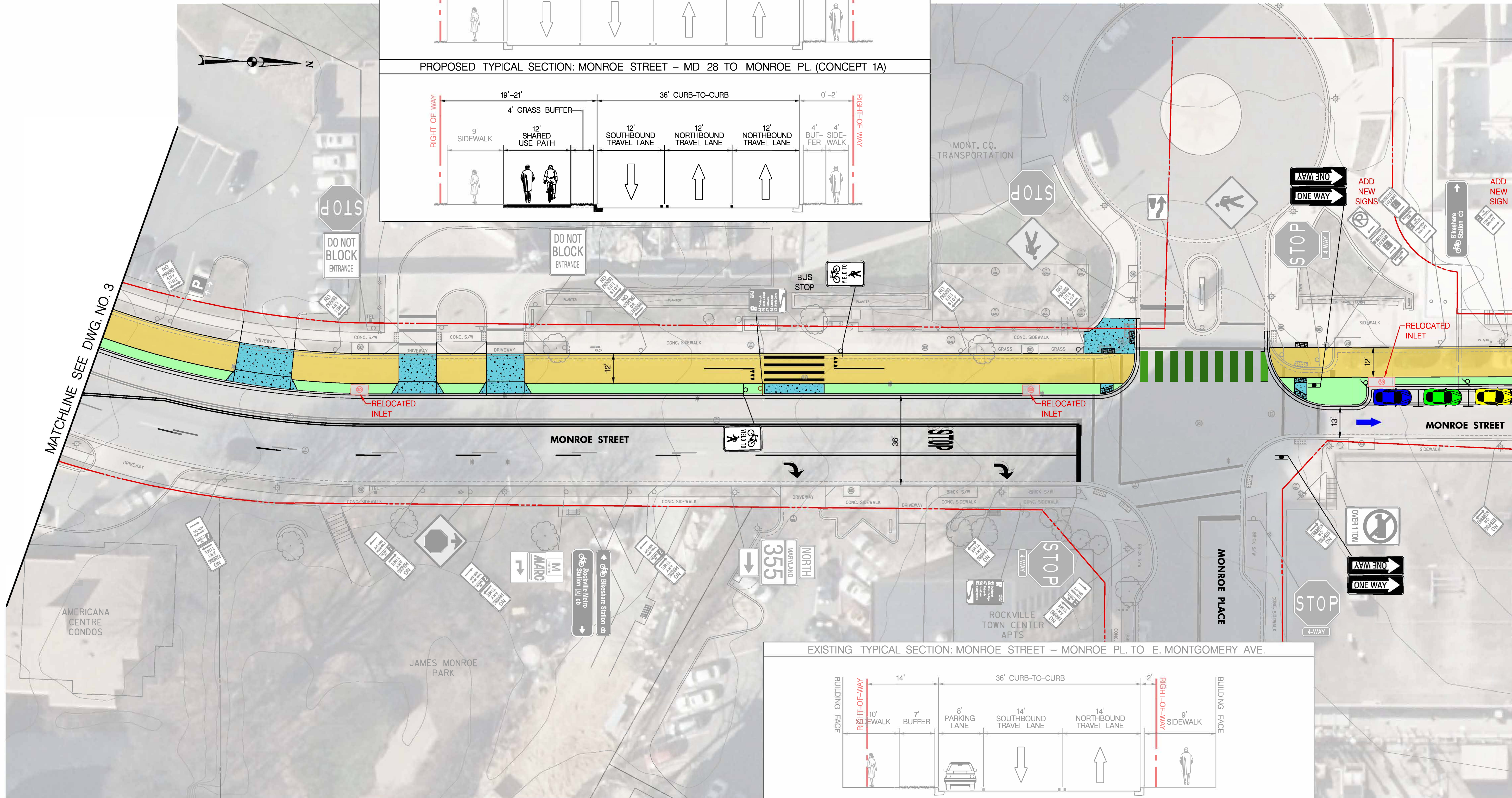
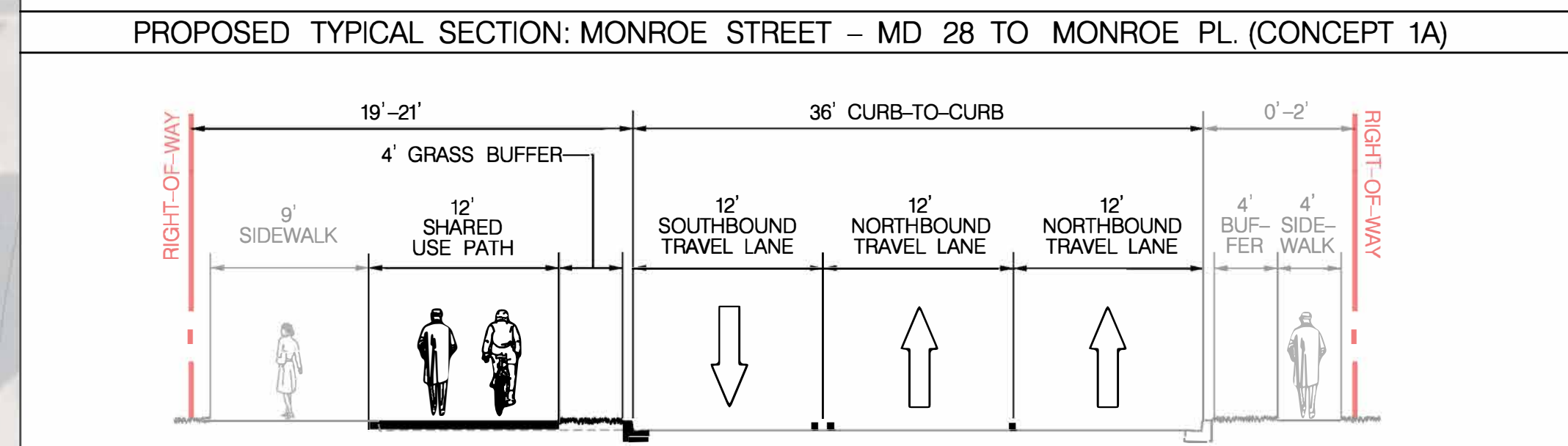
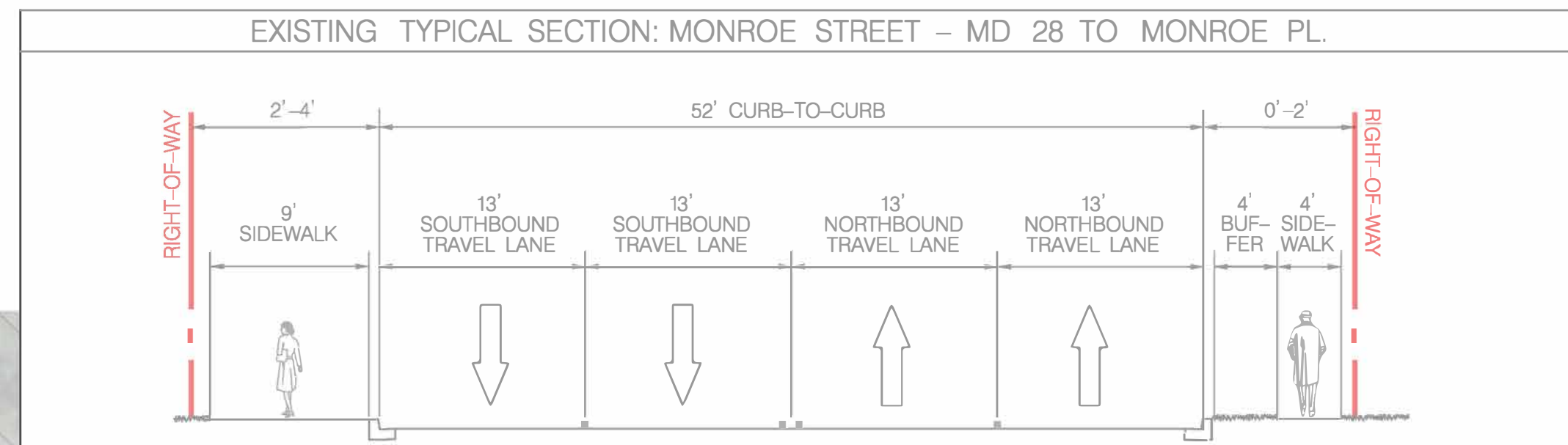
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MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET
 COMPLETE STREETS STUDY
 Election District No. 2 City of Rockville, Maryland

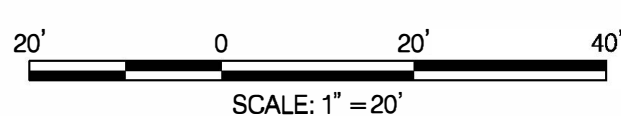
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APPROVAL OF REVISIONS AFTER INITIAL PLAN APPROVAL

DATE SUBMITTED OCTOBER 2022	SCALE 1"=20'	SHEET NO. <u>3</u> OF <u>5</u>	FILE #
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 Election District No. 2 City of Rockville, Maryland

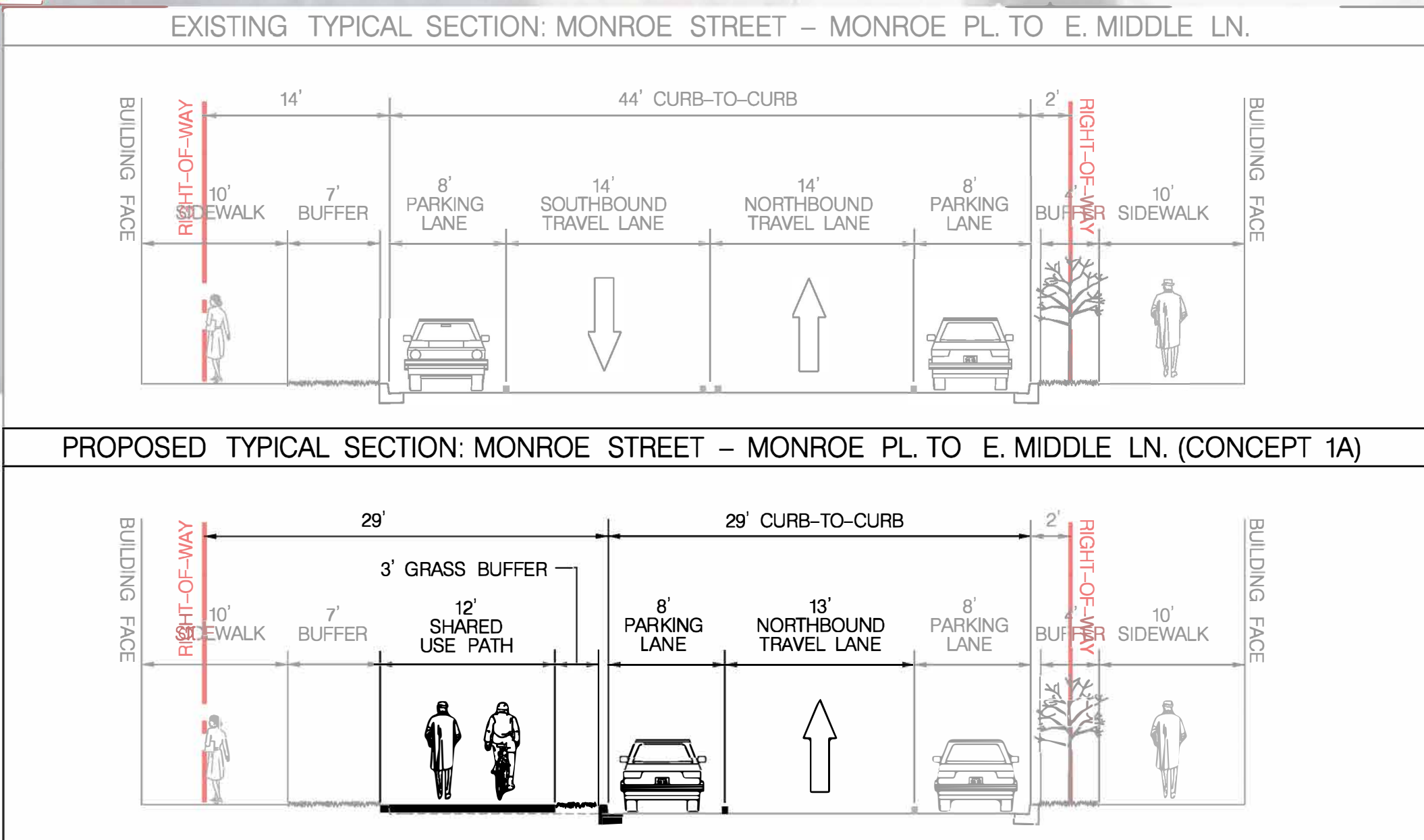
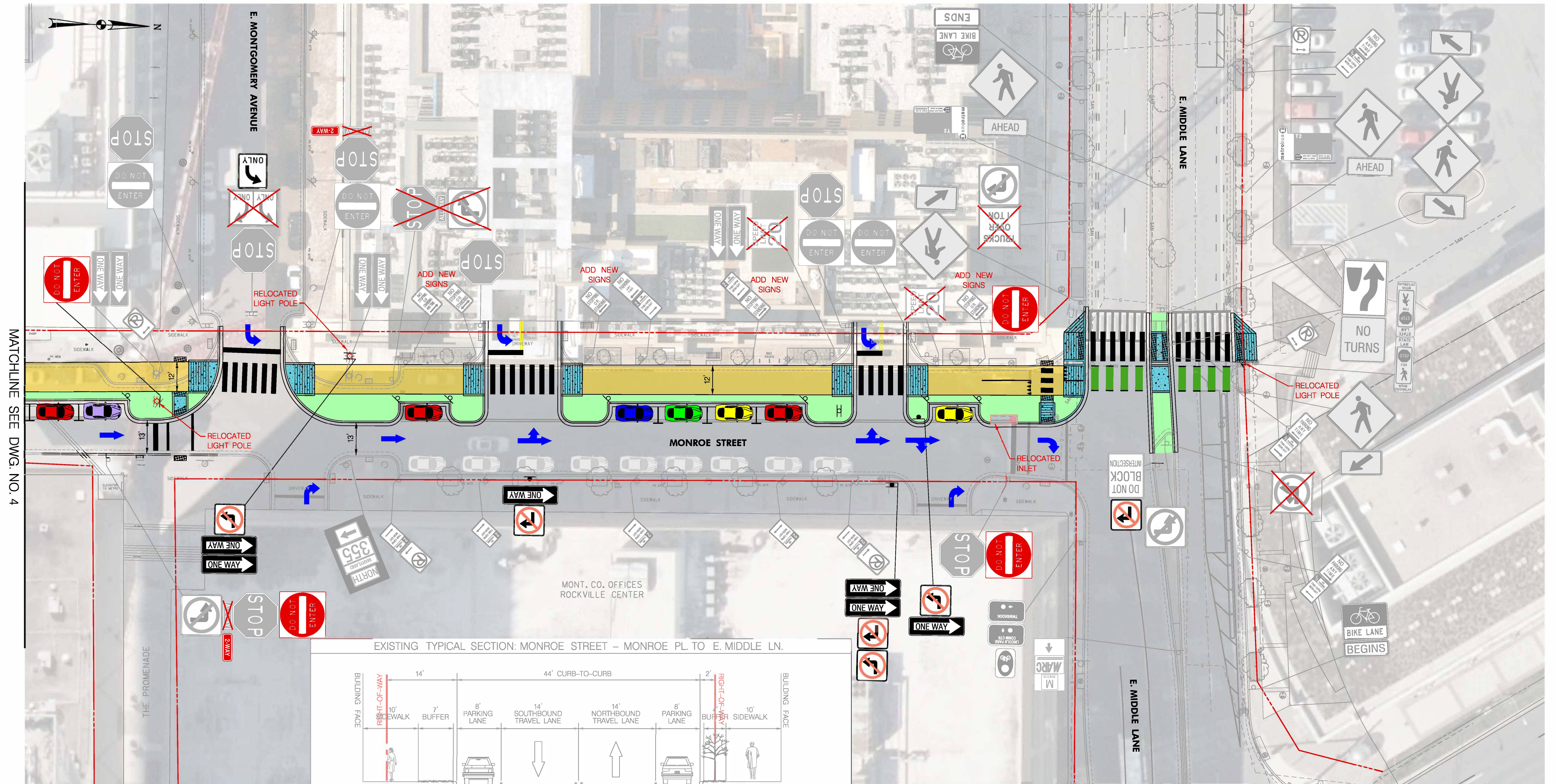
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DESCRIPTION OF REVISION	P.E. INITIAL	DATE	DPW	DATE

DATE SUBMITTED
OCTOBER 2022

SCALE
1"=20'

SHEET
NO. 4
OF 5

FILE #



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 SMP# _____ REVIEWED BY _____
 DIRECTOR OF PUBLIC WORKS APPROVAL DATE

AS BUILT PLAN APPROVAL

 CHIEF, CONSTRUCTION MANAGEMENT APPROVAL DATE

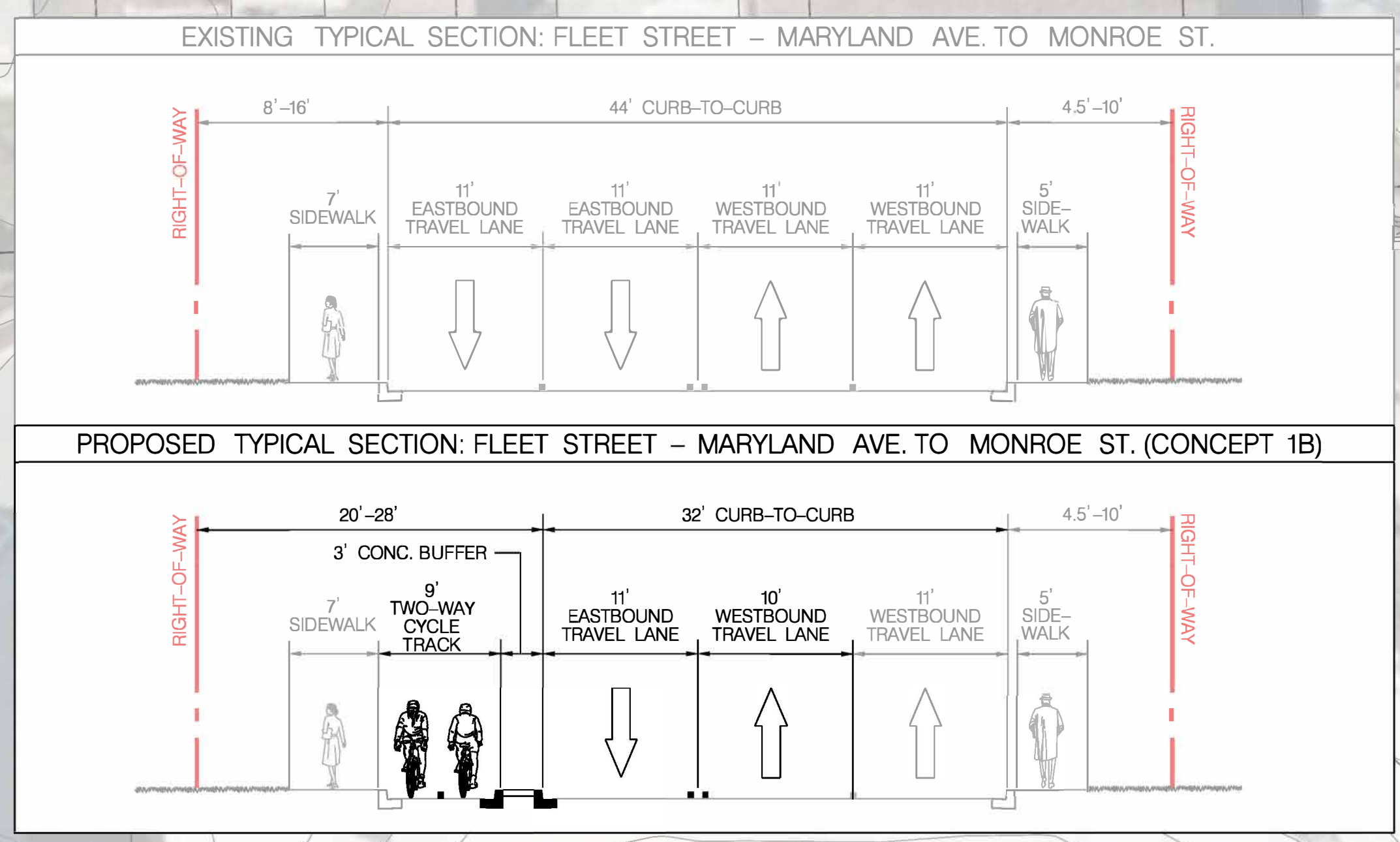
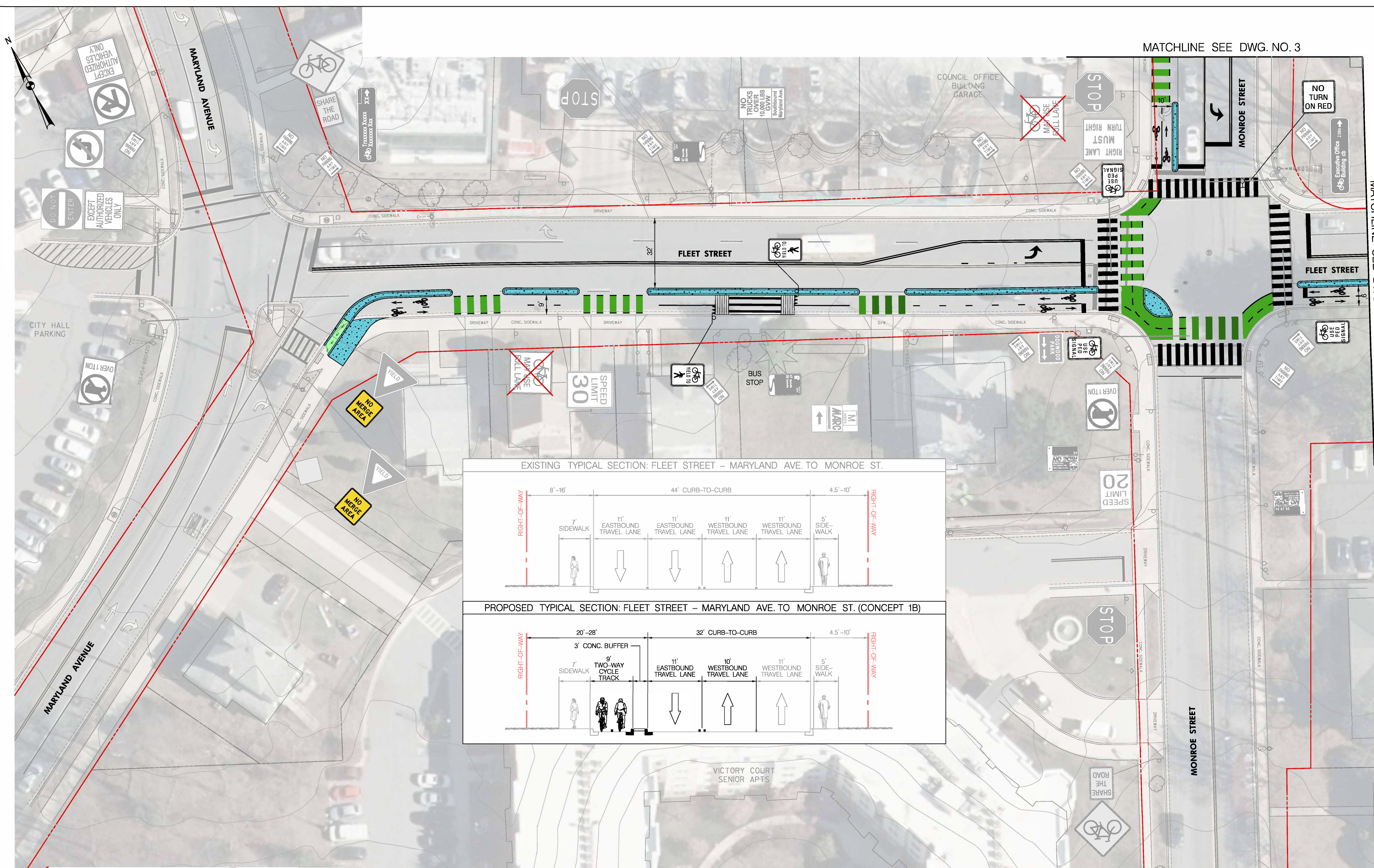
CONCEPT I

MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET
 COMPLETE STREETS STUDY
 Election District No. 2 City of Rockville, Maryland

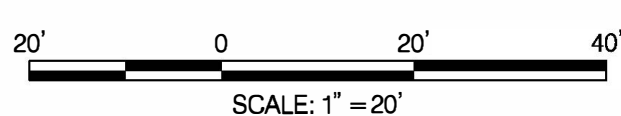
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APPROVAL OF REVISIONS AFTER INITIAL PLAN APPROVAL

DATE SUBMITTED OCTOBER 2022	SCALE 1"=20'	SHEET NO. 5	FILE #
		OF 5	



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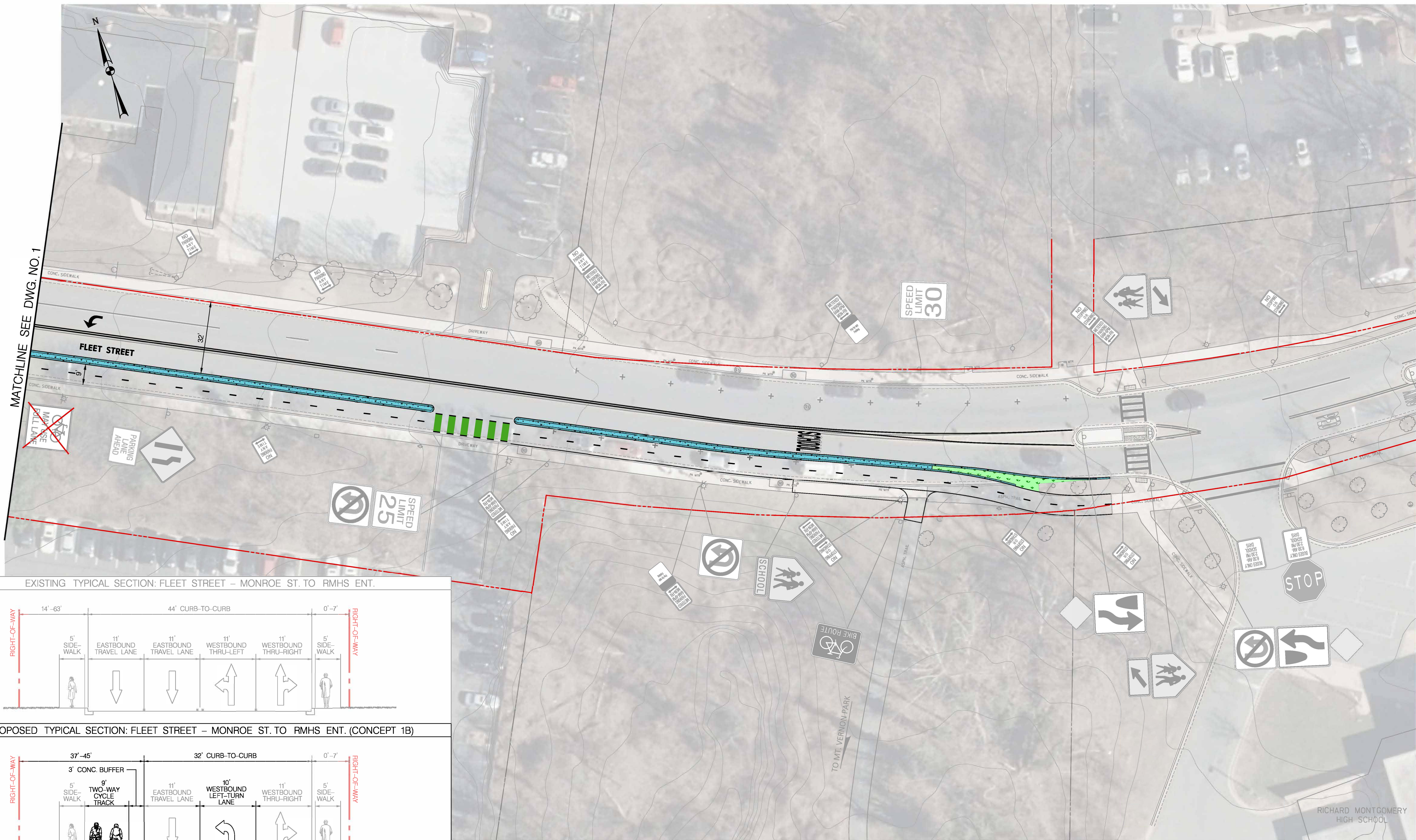
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CHIEF, CONSTRUCTION MANAGEMENT APPROVAL DATE _____

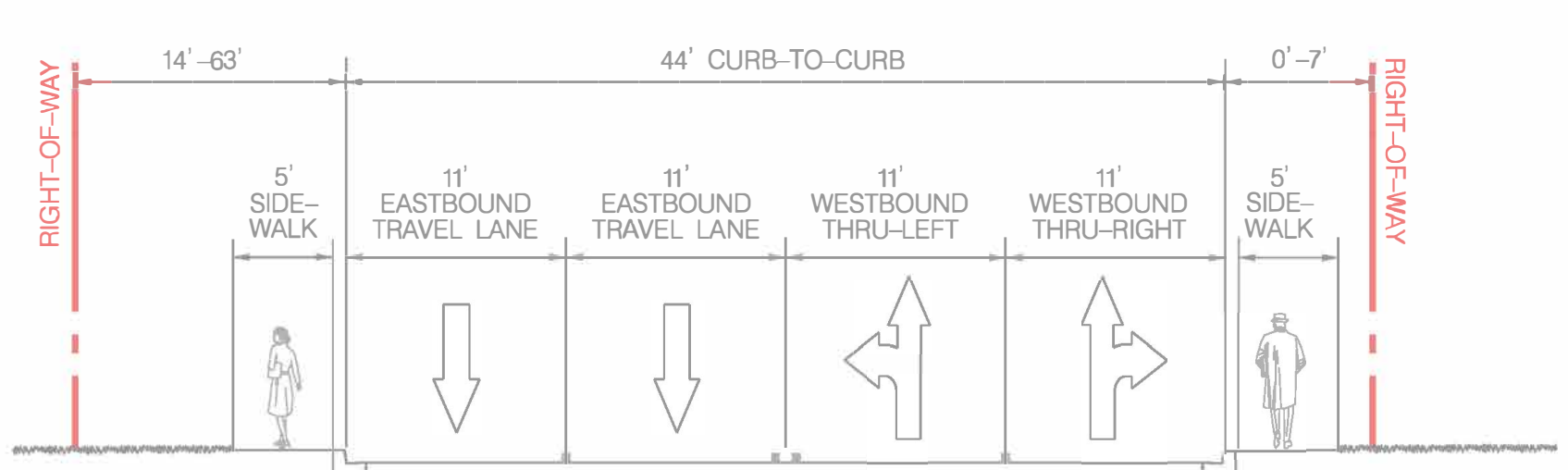
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 COMPLETE STREETS STUDY
 Election District No. 2 City of Rockville, Maryland

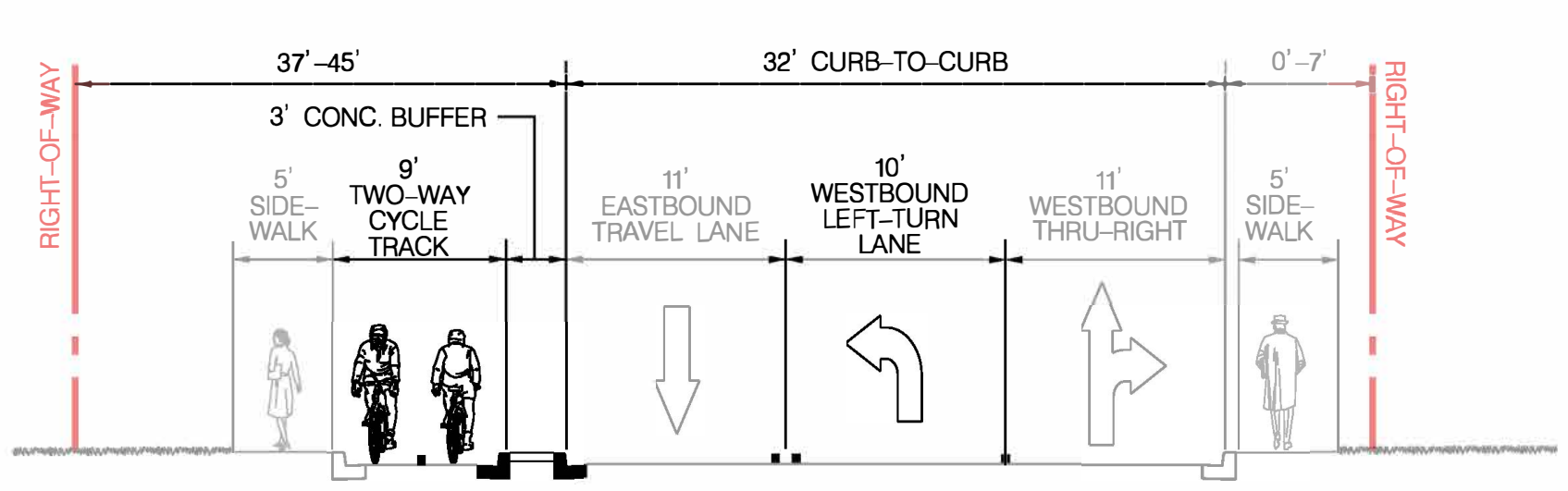
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APPROVAL OF REVISIONS AFTER INITIAL PLAN APPROVAL				
DATE SUBMITTED OCTOBER 2022	SCALE 1"=20'	SHEET NO. 1	FILE #	
		OF 5		



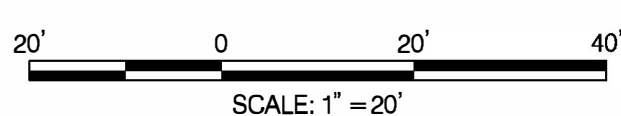
EXISTING TYPICAL SECTION: FLEET STREET - MONROE ST. TO RMHS ENT.



PROPOSED TYPICAL SECTION: FLEET STREET - MONROE ST. TO RMHS ENT. (CONCEPT 1B)



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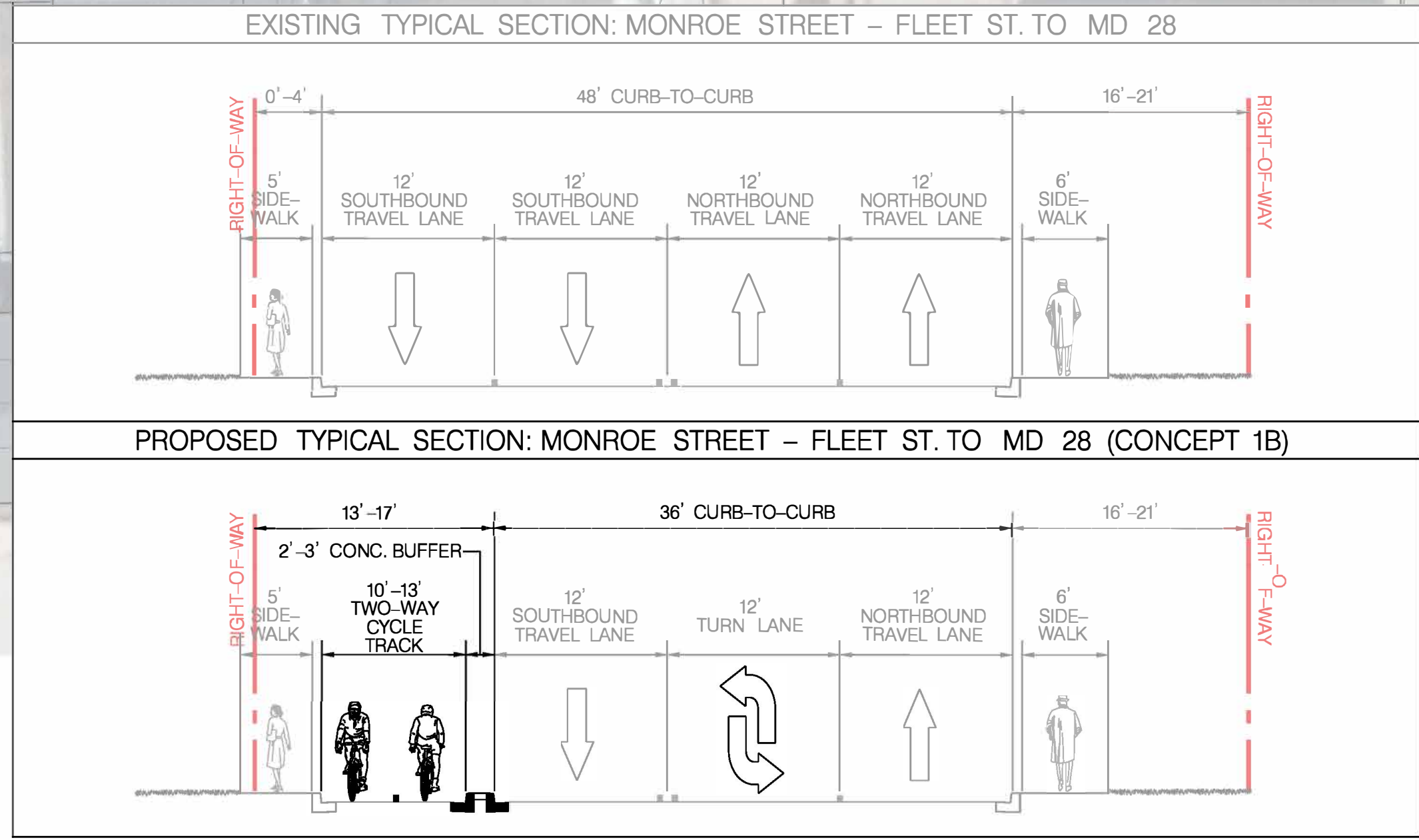
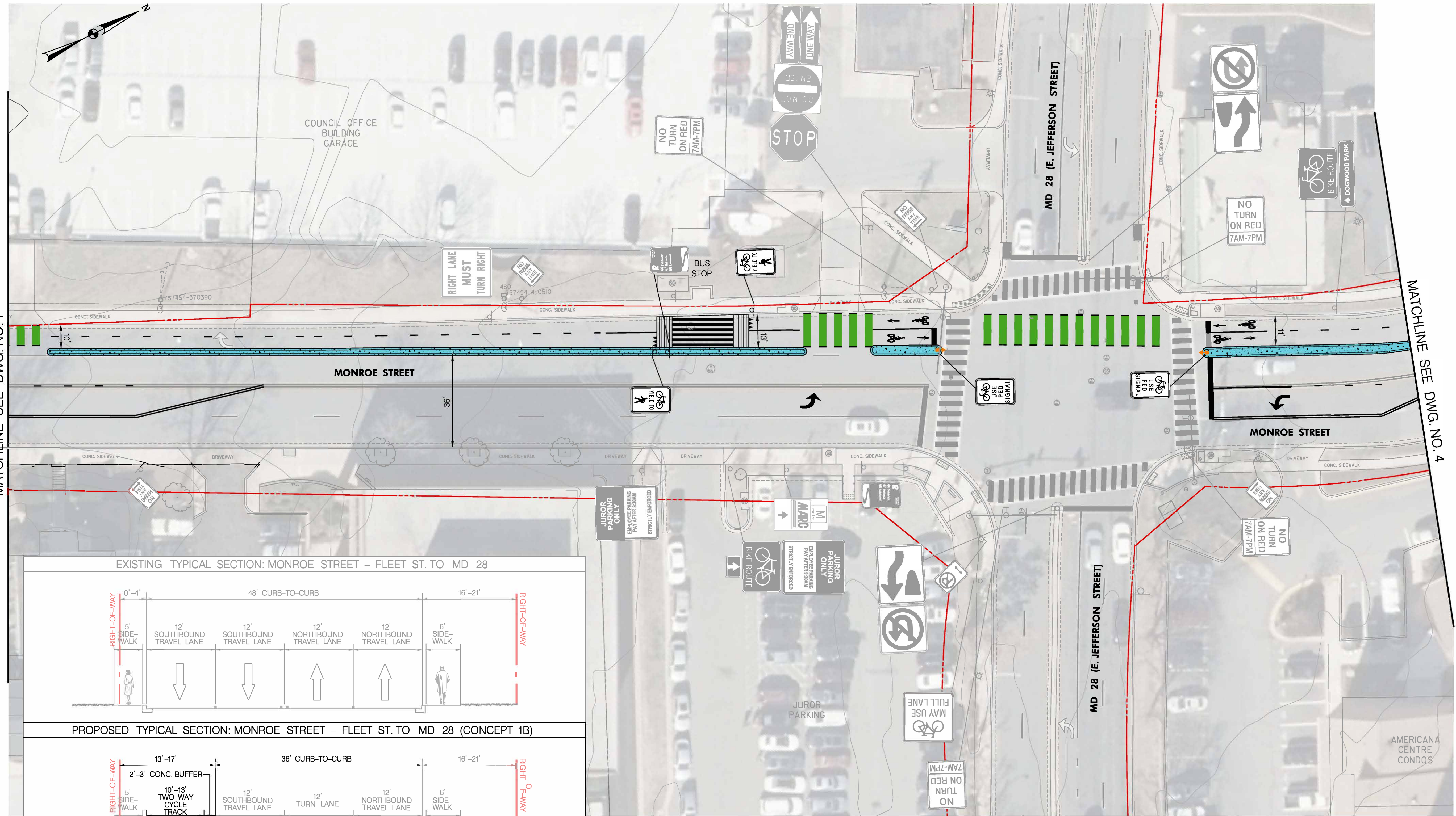
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CONCEPT 2

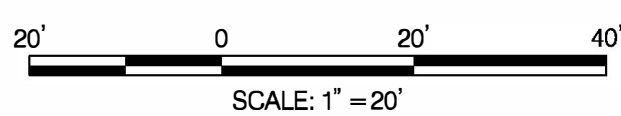
MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET
 COMPLETE STREETS STUDY
 Election District No. 2 City of Rockville, Maryland

DESCRIPTION OF REVISION	P.E. INITIAL	DATE	DPW	DATE

APPROVAL OF REVISIONS AFTER INITIAL PLAN APPROVAL
 DATE SUBMITTED
 OCTOBER 2022
 SCALE 1"=20'
 SHEET NO. 2
 OF 5
 FILE # _____



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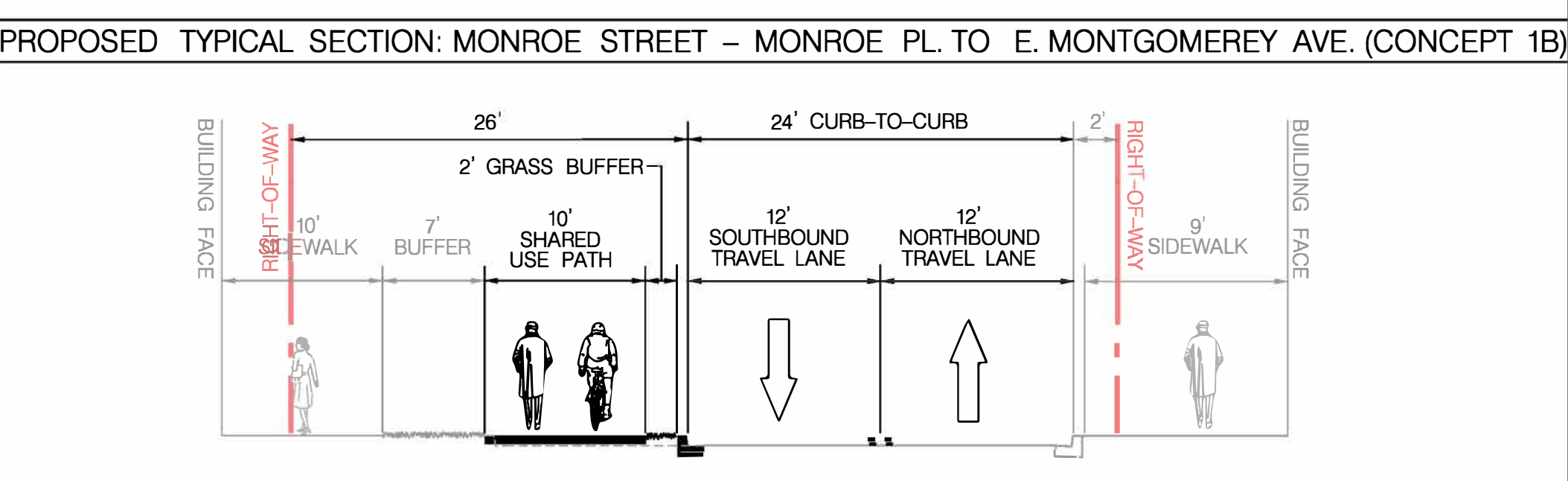
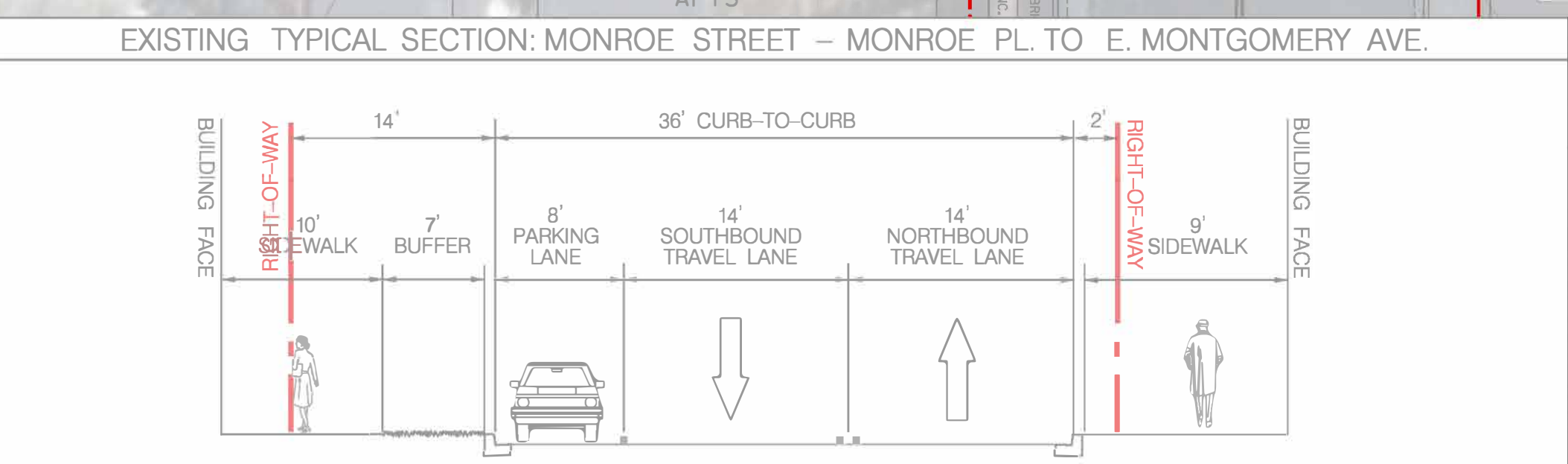
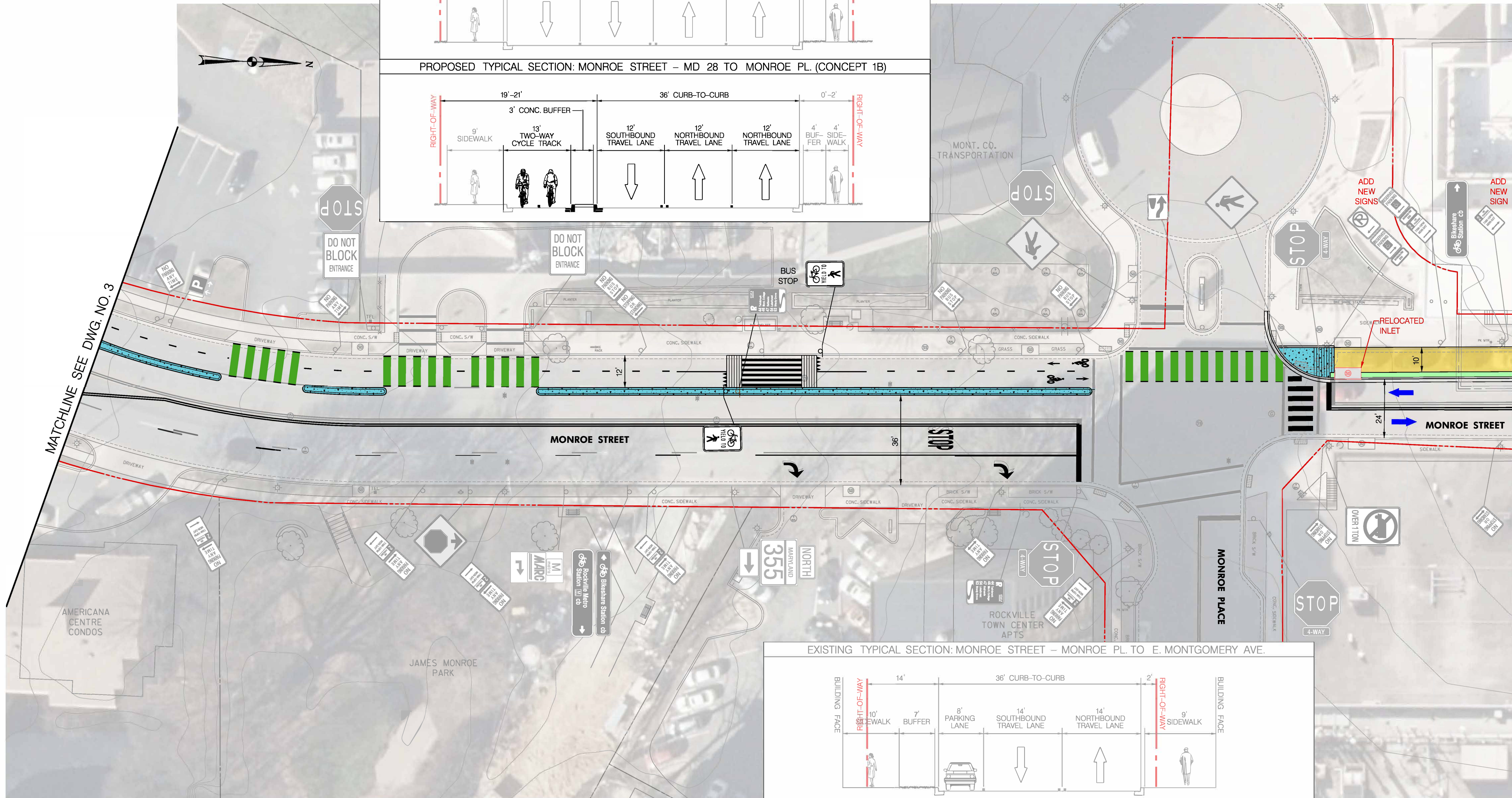
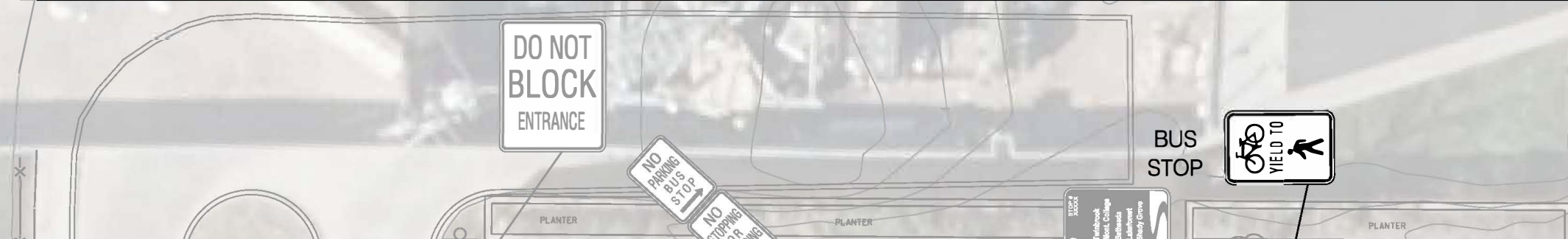
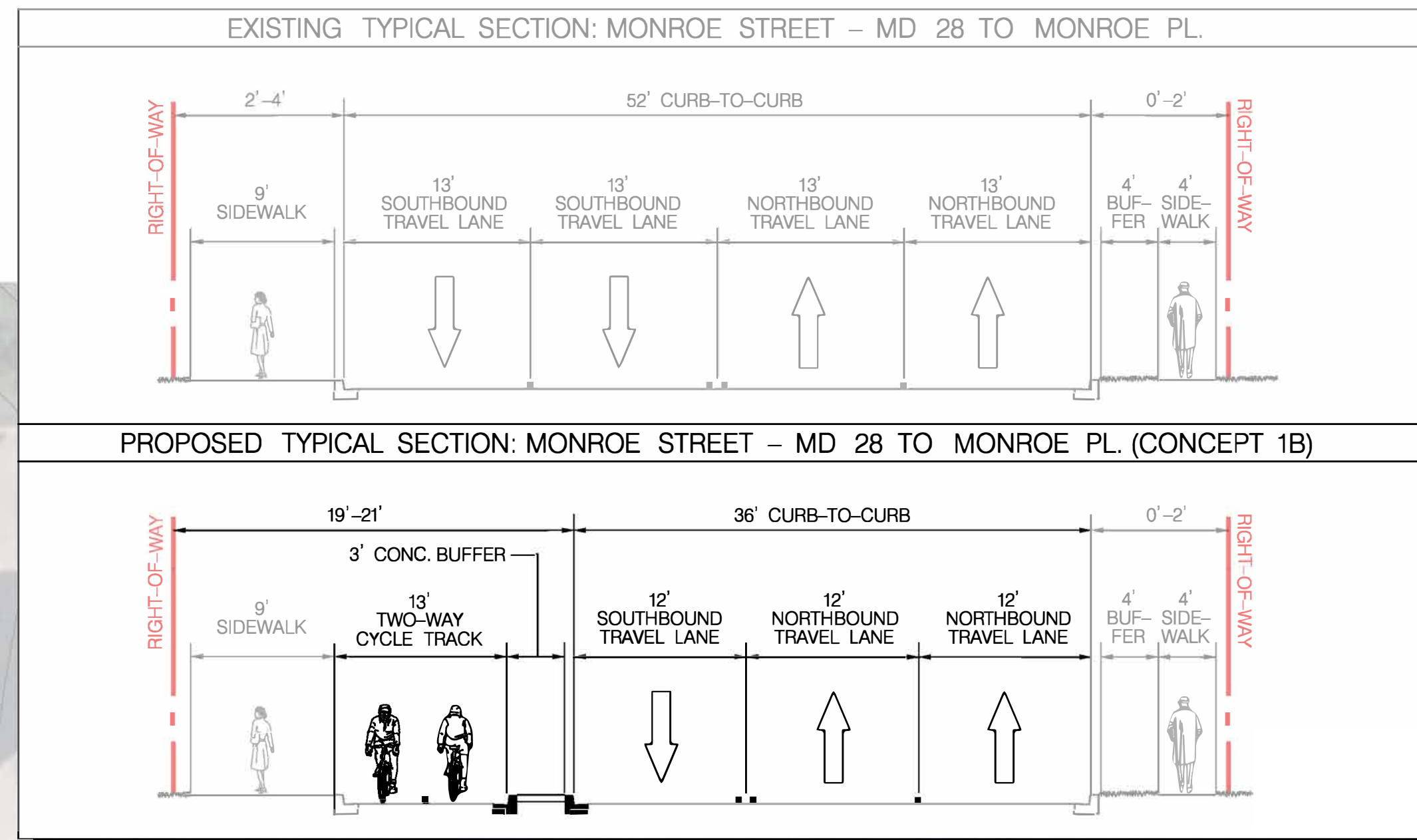
CONCEPT 2

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

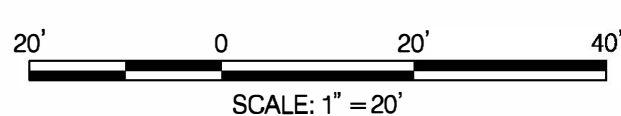
Election District No. 2 City of Rockville, Maryland

DESCRIPTION OF REVISION	P.E. INITIAL	DATE	DPW	DATE

APPROVAL OF REVISIONS AFTER INITIAL PLAN APPROVAL			
DATE SUBMITTED	SCALE	SHEET NO.	FILE #
OCTOBER 2022	1"=20'	3	
		OF 5	



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CONCEPT 2

MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET
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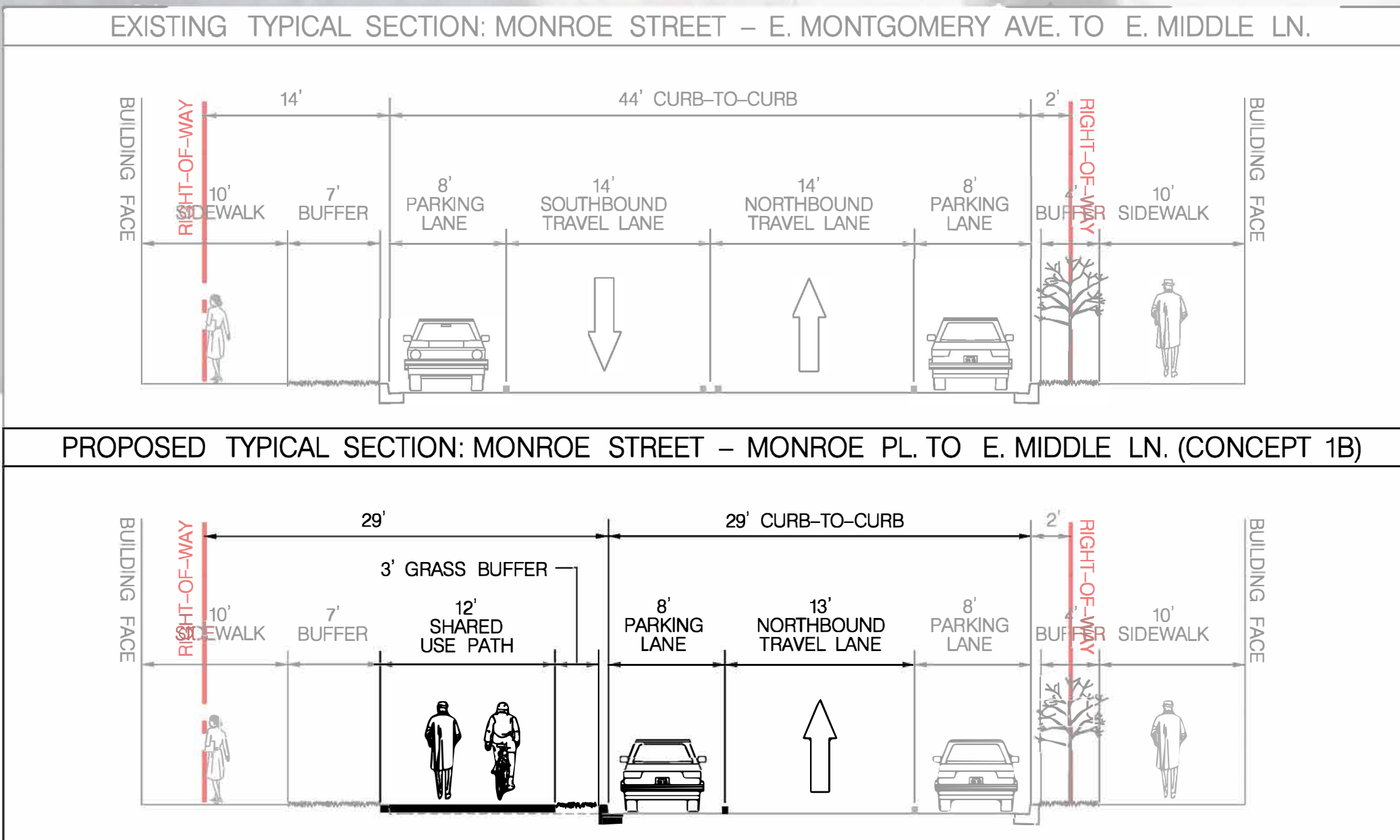
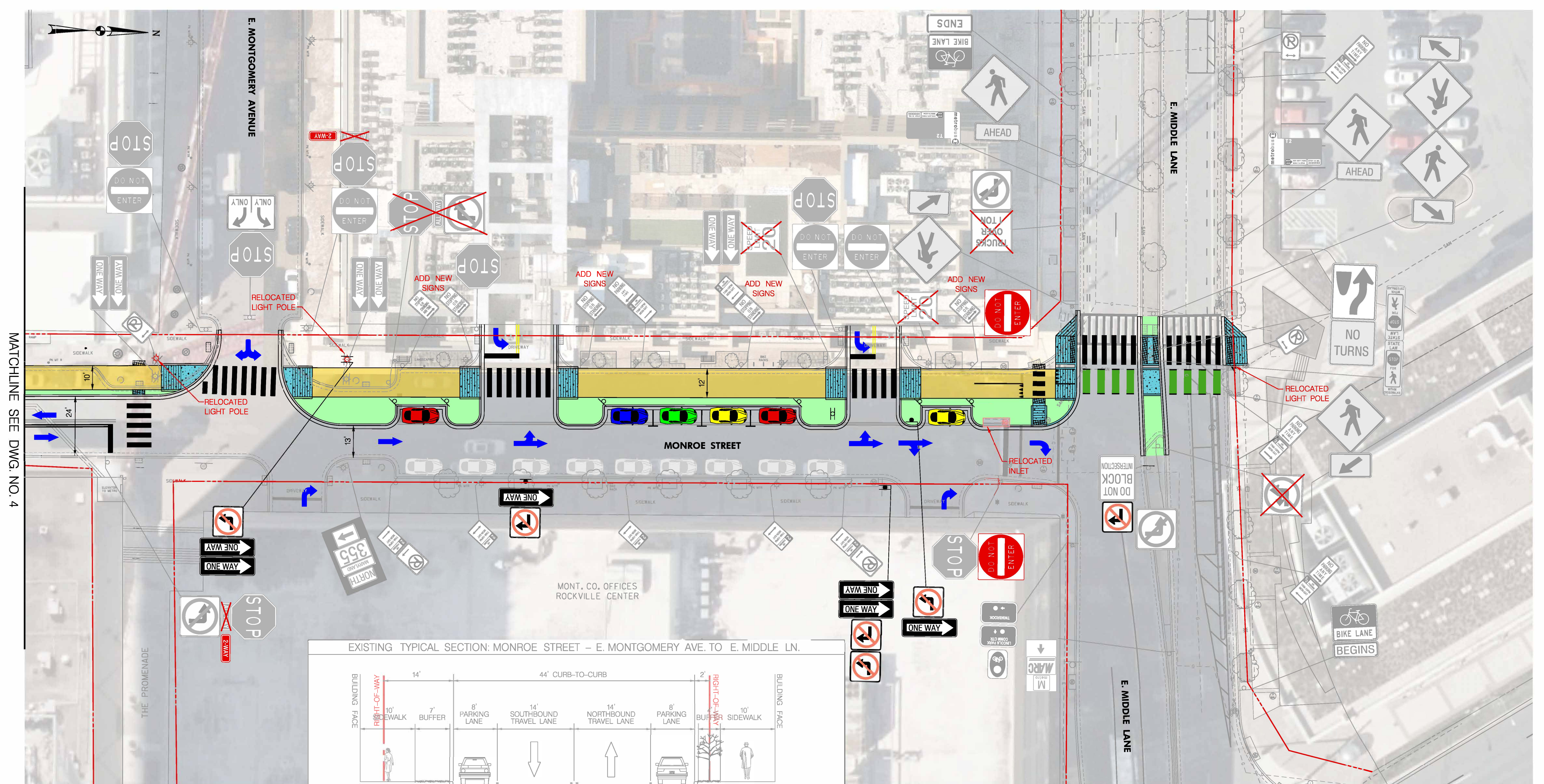
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SHEET NO. 4 OF 5

FILE # _____

MATCHLINE SEE DWG. NO. 3

MATCHLINE SEE DWG. NO. 5



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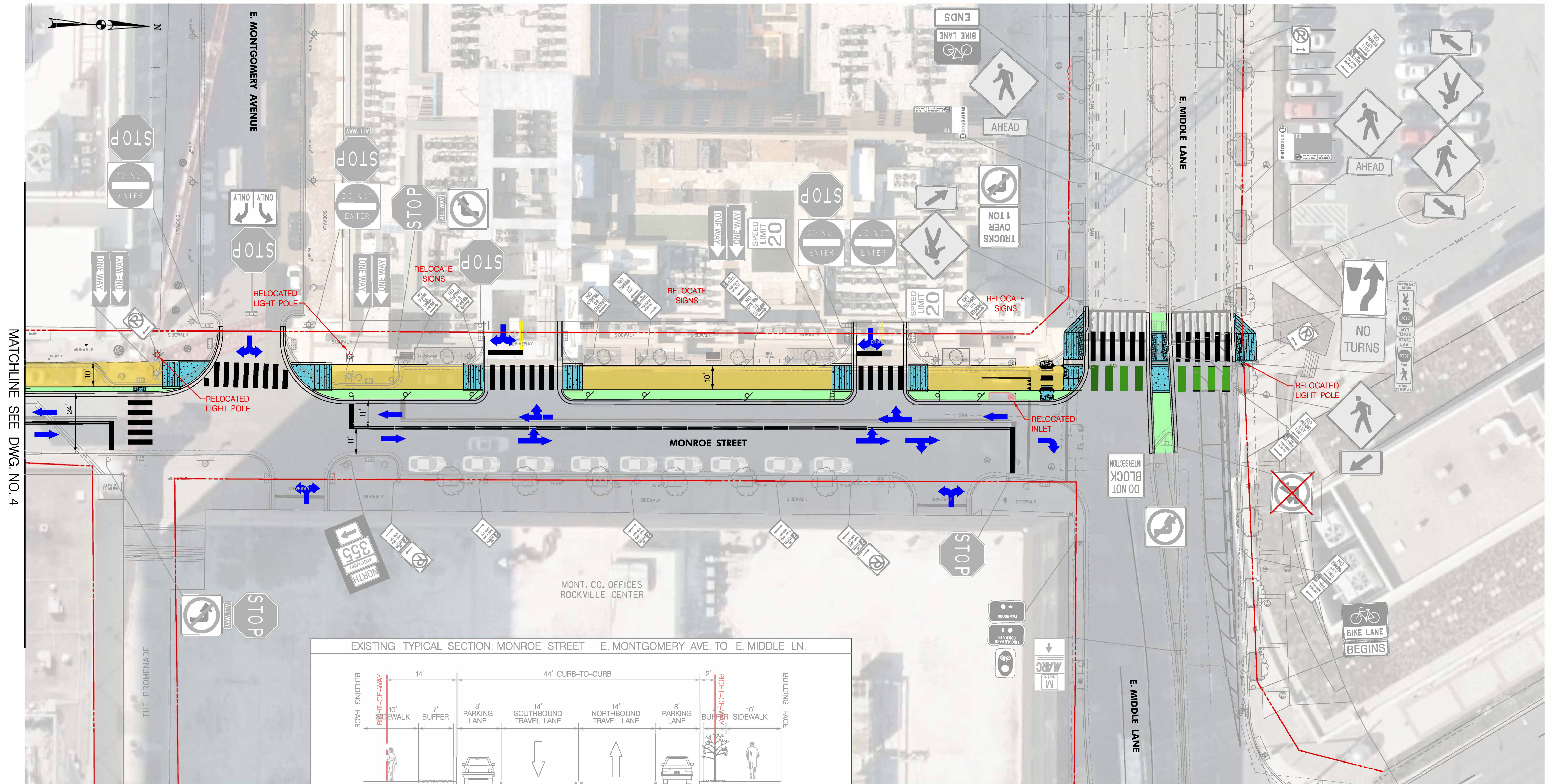
CONCEPT 12

MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET
 COMPLETE STREETS STUDY
 Election District No. 2 City of Rockville, Maryland

DESCRIPTION OF REVISION	P.E. INITIAL	DATE	DPW	DATE

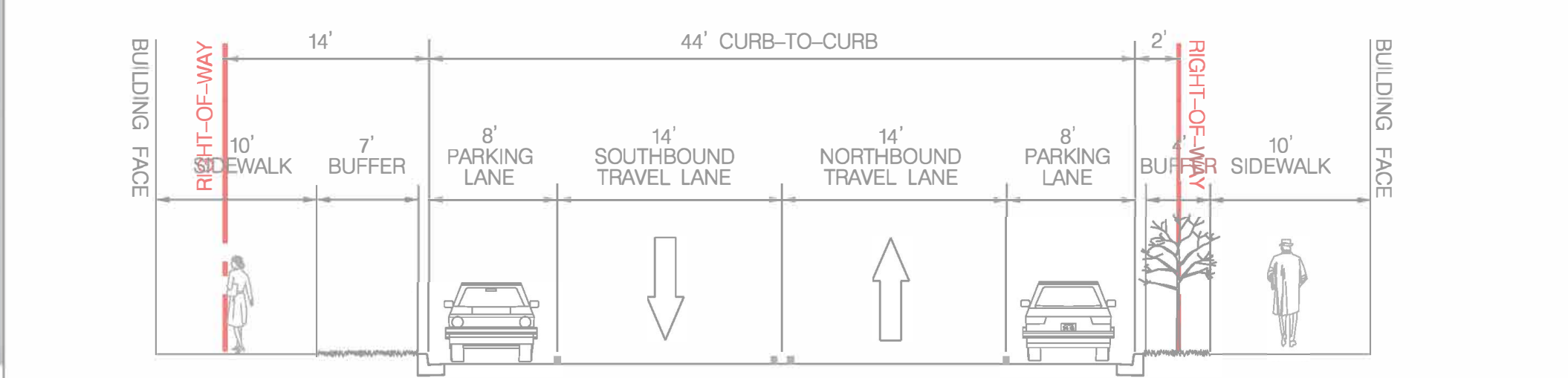
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DATE SUBMITTED OCTOBER 2022	SCALE 1"=20'	SHEET NO. 5	FILE #
		OF 5	

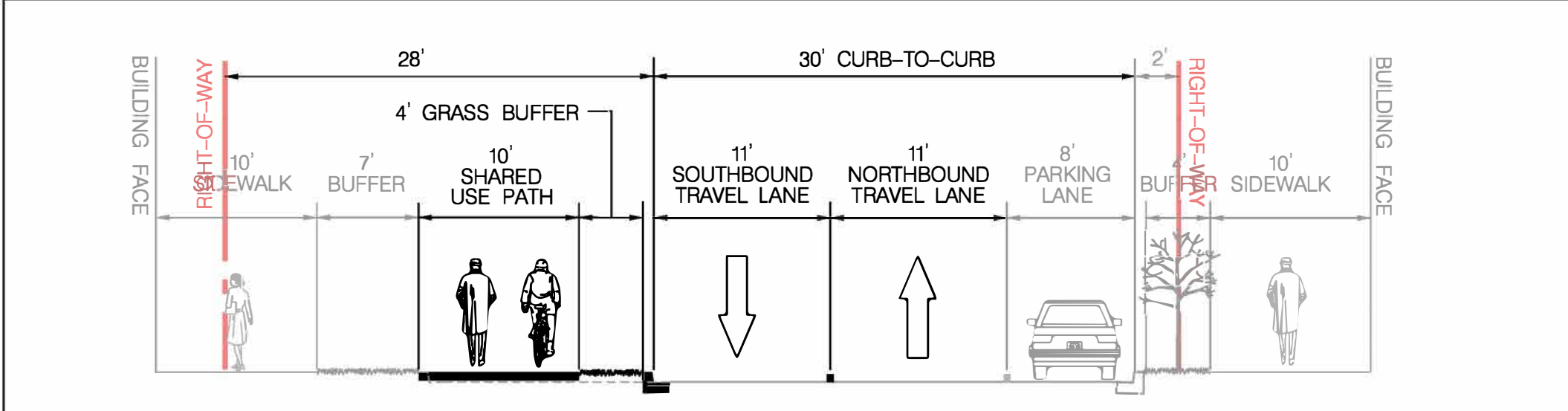


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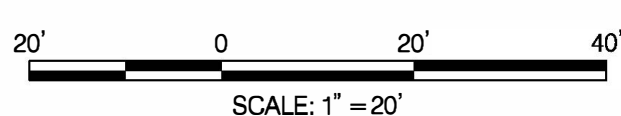
EXISTING TYPICAL SECTION: MONROE STREET - E. MONTGOMERY AVE. TO E. MIDDLE LN.



PROPOSED TYPICAL SECTION: MONROE STREET - MONROE PL. TO E. MIDDLE LN. (CONCEPT 1C)



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MONROE STREET 2-WAY OPTION

MONROE STREET FROM E. MIDDLE LANE TO FLEET STREET
 COMPLETE STREETS STUDY
 Election District No. 2 City of Rockville, Maryland

DESCRIPTION OF REVISION	P.E. INITIAL	DATE	DPW	DATE

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DATE SUBMITTED	SCALE	SHEET NO.	FILE #	
OCTOBER 2022	1"=20'	5	5	
		OF 5		



Appendix D: Cost Breakdown

			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
SUBTOTAL					
MOT	10% of total				
Landscaping	5% of total				
Mobilization	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



Appendix E: Public Presentation

Fleet and Monroe Streets

Complete Streets



City of
Rockville
Get Into It

May 4th, 2023

Mead
& Hunt

Introduction / Presentation Outline

Funding Source:
MwCOG TLC
grant

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



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



Constraints & Opportunities

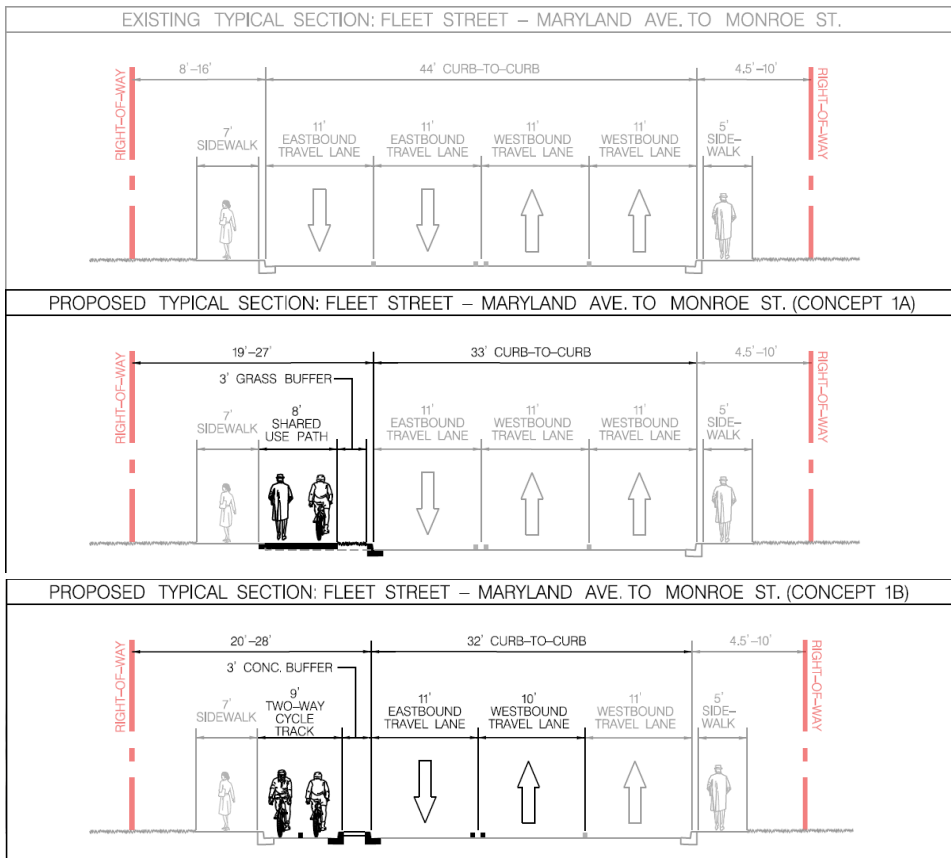
- Constraints
 - Narrow Public Right-of-Way
 - Narrow travel lanes (11' to 12')
 - Curbside on-street parking in Town Center is desirable
- Opportunities
 - Select areas of extra roadway capacity → Opportunity for repurposing travel lanes
 - Grid network allows traffic diversions
 - Improved safety &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

Result: Lane Removal on Fleet
and on Monroe



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

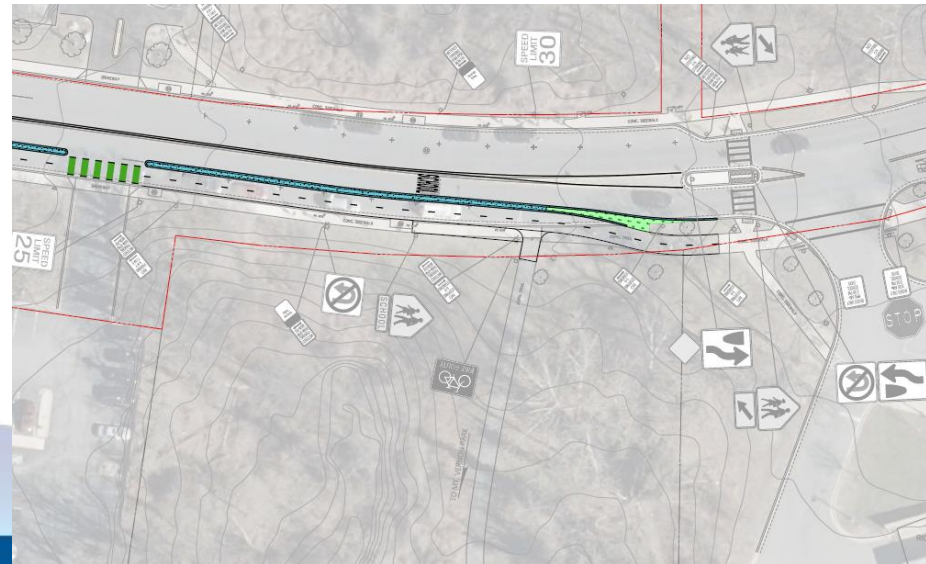
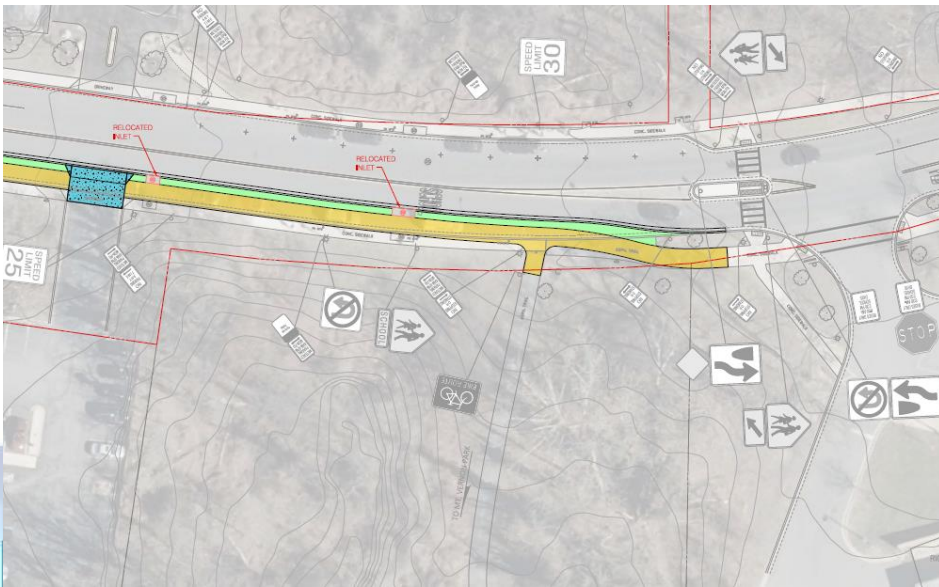


Curbside bike lanes on each side of road was dismissed. Too narrow. Unbuffered. unprotected



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



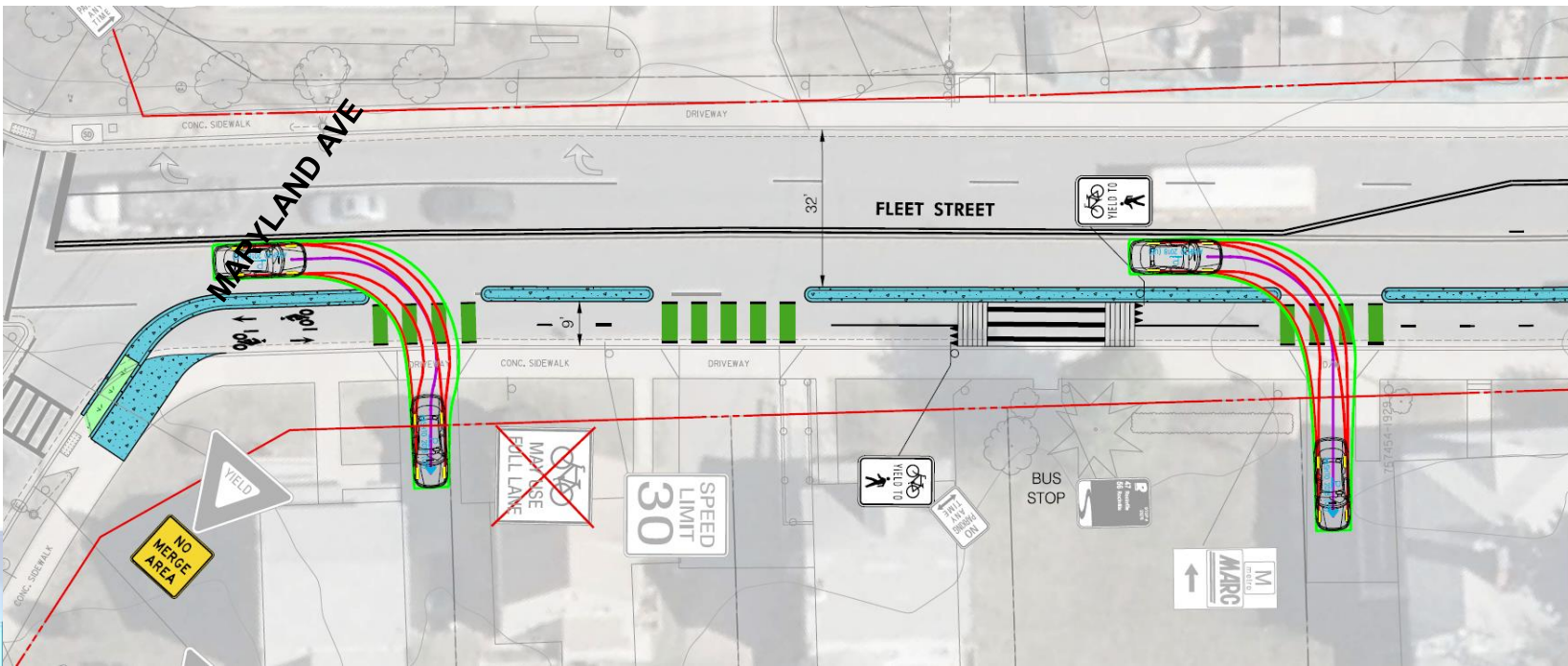
Details and Options for Discussion

- 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

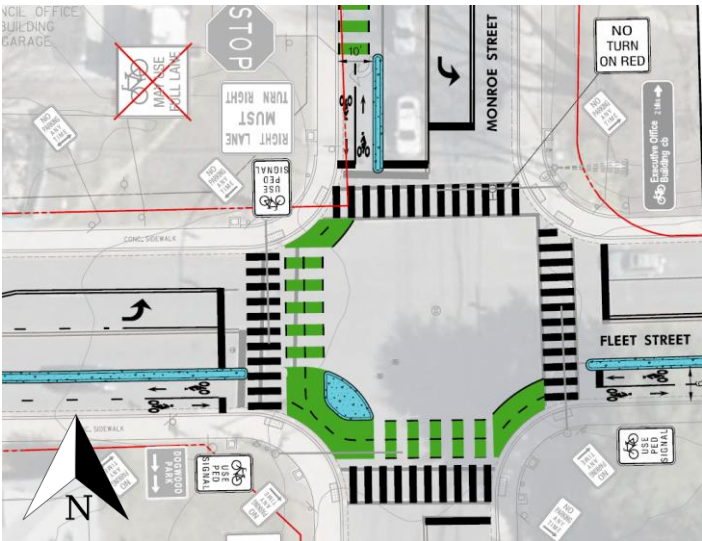
- Adjustments to vertical barriers as need to reflect Turning Movement
 - Drivers will need wider clearance to execute backing maneuvers from driveway



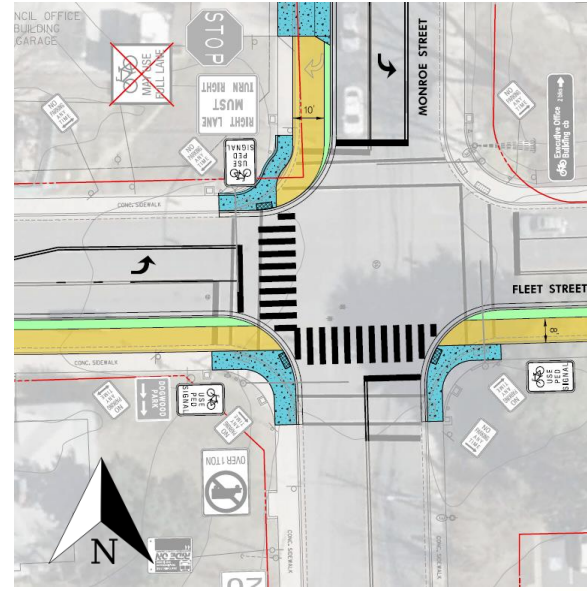
Crossing Fleet / Monroe with WALK



- 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



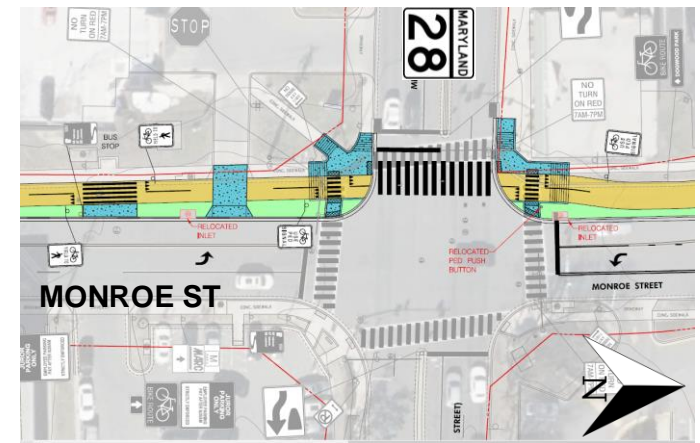
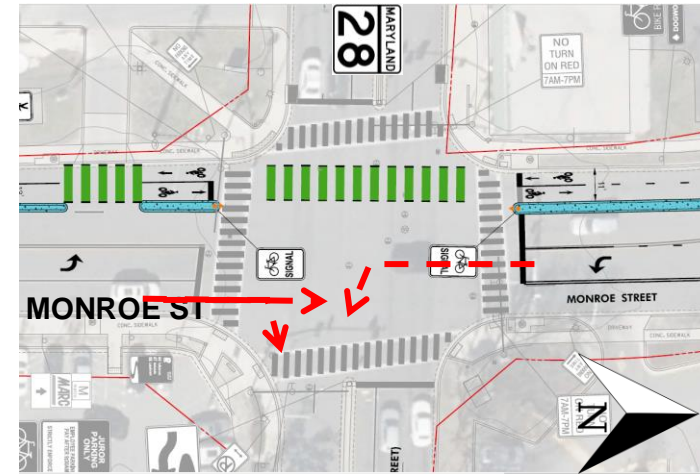
Applicable where turn volumes are low



Crossing Jefferson (MD 28)

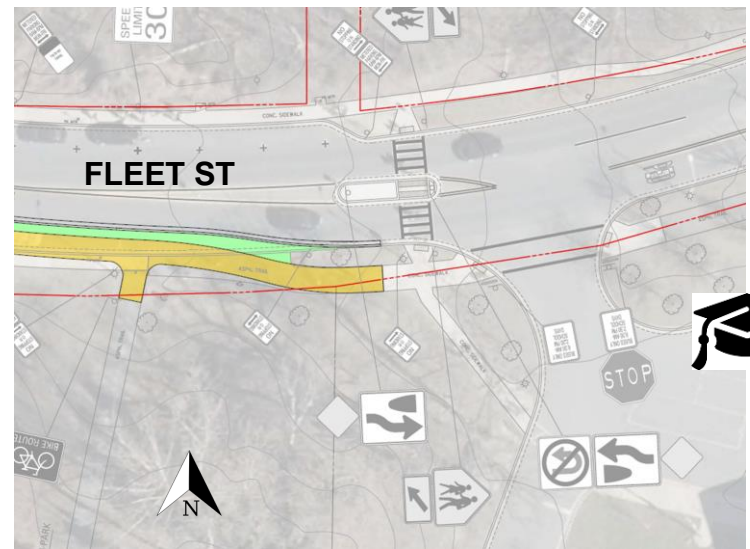
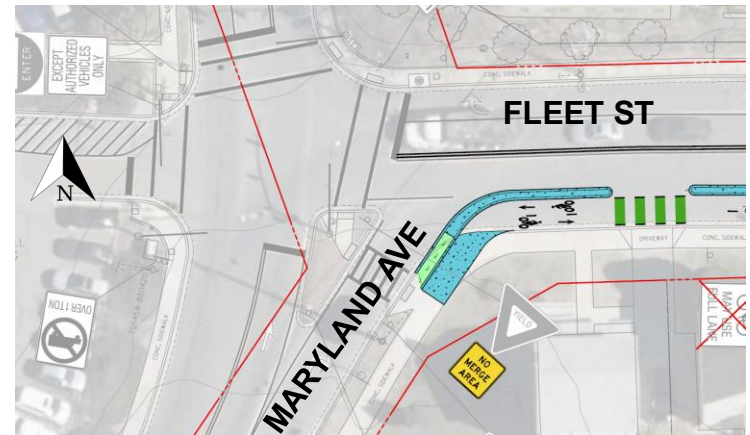


- Bike signals not currently permitted on MDOT SHA roads.
- Per Current SHA standards, bikes can cross with a protected WALK phase. NB protected Left-turn and SB through-rights would have to be held.
 - 1) allow NB through-rights concurrently / SB left permitted
 - 2) restrict left turns and NB is 1 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



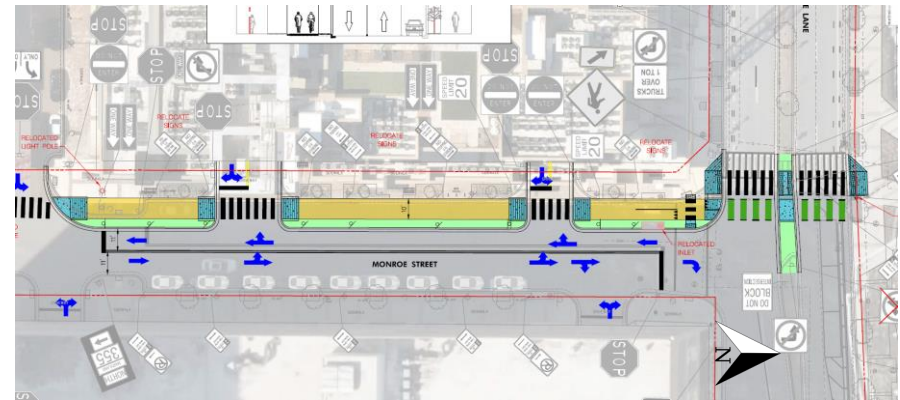
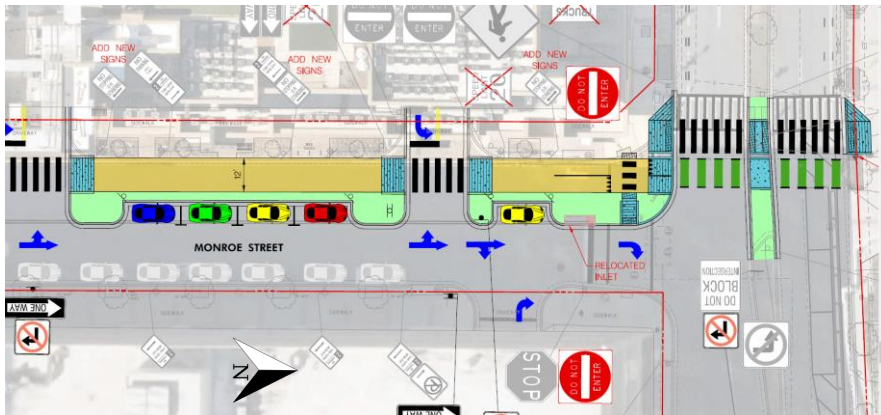
Southern Termini

- 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



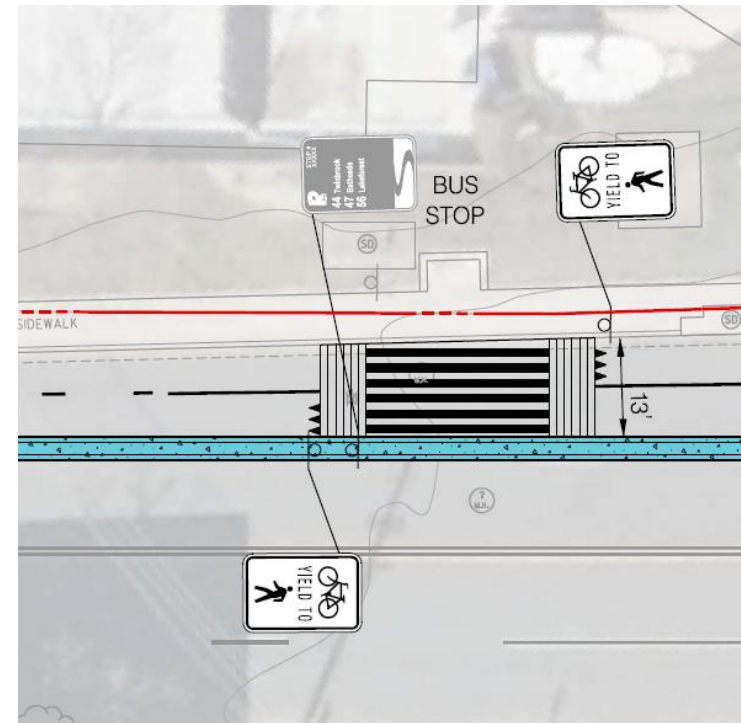
Terminus Options at East Middle Lane

- 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 <i>exclusive</i> WALK at MD 28	Cycletrack with <i>concurrent</i> NB traffic at MD 28
Monroe St & E Middle Ln	A (B)	A (B)	A (B)	A (B)
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 (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



Construction Cost

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

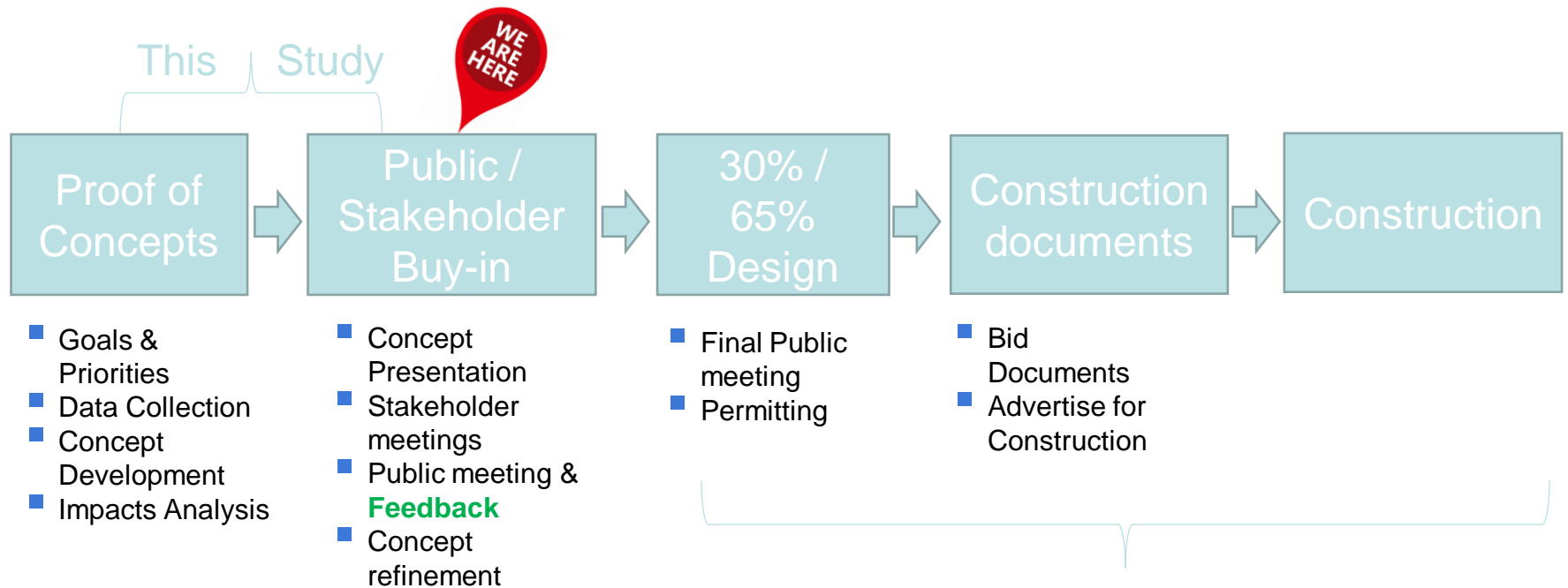
Lost Parking

- 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



Next Steps / Project Flow



Federal and State Grant Opportunities



Questions & Feedback

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

