North Potomac Yard Small Area Plan Update

Multimodal Transportation Study

Prepared for:

The JBG Companies®

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1. Introduction and Executive Summary

1.1 OVERVIEW

In 2010, the City of Alexandria approved a Small Area Plan for Potomac Yard Landbay F, the northern portion of the Potomac Yard property (also referred to as North Potomac Yard), located east of US Route 1 and just south of the City/Arlington County line. The 2010 North Potomac Yard Small Area Plan (herein referred to as the 2010 Plan) established a framework for the land development, economic growth, and community features of North Potomac Yard. The 2010 Plan also established guidelines and principles to optimize the mixed-use potential of approximately 7.5 million square feet of development by envisioning an efficient, urban street network that provided space for all modes of travel and supported a mix of land uses complementary to and consistent with the development plans for South Potomac Yard. Further, the 2010 Plan encouraged a range of right-sized and competitively-priced parking opportunities and made provisions for several sustainable and innovative designs and practices.

Since the completion of the 2010 Plan, much has changed along the US Route 1 Corridor ("the Corridor"). The cross-section of US Route 1 has been widened to include room for dedicated transit lanes. Much of the South Potomac Yard Landbays has been built and occupied and planning for the next stages of development along the west side of US Route 1 has begun with the Oakville Triangle/ Route 1 Corridor Vision Plan. The long-desired Potomac Yard Metrorail Station has been approved for design and construction, bringing with it a significant improvement in local and regional transit accessibility and the potential for a lasting increase in the share of transit trips within the Corridor. Potomac Avenue, a four-lane road to the east of US Route 1, has been developed as a viable alternate north-south corridor, parallel to US Route 1 between northern Alexandria and Crystal City. Potomac Yard Park, a 24-acre facility, was developed along Potomac Avenue, offering open space and play areas for the South Potomac Yard community.

Significant changes have also occurred throughout the City since the completion of the 2010 Plan. Updates to the City's Pedestrian and Bicycle Chapters of the Transportation Master Plan have identified over 88 miles of new bicycle facilities, over 500 facility recommendations, and 10 prioritized new sidewalk projects to provide nearly 4 miles of new sidewalks in the City. The 2013 Housing Master Plan reaffirmed the City's goal of *housing for all* to meet the diverse and changing housing preferences of current and future residents and to strategically provide affordable housing in a manner that enhances the connectivity between mixed-use developments, high-capacity transit, employment centers, and other amenities. The City also approved a Complete Streets policy in 2011 that requires all new streets to be designed for all roadway users.

With the 2010 Plan, the changes along the US Route 1 Corridor, and the City-wide changes as a backdrop and a catalyst for future action, the owner's representative for the North Potomac Yard property, JBG Companies (JBG), has indicated a desire to begin the first phase of the redevelopment process for North Potomac Yard.

While some amendments to the 2010 plan are necessary to facilitate the first phase of development, the proposed development remains consistent with the intent of the 2010 Plan, i.e. to provide a mixed-use, transit-oriented urban community and the specified mix of office, residential, retail and other land uses.

JBG's proposed updates to the 2010 plan, as well as the significant changes within the Corridor and across the City have created the opportunity to revisit the phasing, design, and character of North Potomac Yard. As part of the North Potomac Yard Small Area Plan Update (herein referred to as the Updated Plan), this multimodal transportation study will demonstrate that the current and future planned transportation network will support the redevelopment of North Potomac Yard and further the City's multimodal transportation goals.

1.2 STUDY PURPOSE

This study serves as a companion to the transportation chapter of the Small Area Plan update. It documents and analyzes existing transportation conditions, future conditions under the previous 2010 Plan development approval (referred to as Baseline Conditions) and future conditions with the proposed Updated Plan development program (referred to as Build Conditions). Analysis of existing conditions includes a review of current multimodal traffic infrastructure, amenities, and operations. Analysis of future conditions includes known future transportation improvements, anticipated growth in regional traffic, estimated traffic generated by nearby approved and unbuilt developments, and traffic generated by the redevelopment of North Potomac Yard. The study examines two future years, 2021 (Phase I) and 2040 (full build-out horizon year).

The intent of this study is to compare the transportation impacts associated with the Updated Plan to the transportation impacts associated with the 2010 Plan and demonstrate that the reallocation of land uses in the Updated Plan to anticipate greater levels of office development compared to the land use of the 2010 Plan results in similar traffic impacts when compared with the 2010 Plan, which has already been approved by the City and the Virginia Department of Transportation (VDOT). This study was prepared in accordance with the City's Transportation Planning Administrative Guidelines – Multimodal Transportation Studies (March 2013). This study also complies with *VDOT Traffic Impact Analysis Regulations 24 VAC 30-155* under Chapter 527 of the 2006 Code of Virginia.

1.3 CIVIC ENGAGEMENT

JBG and the City view the community as a vital asset and resource in preparing the North Potomac Yard Small Area Plan Update. Meaningful public involvement is important in developing community-focused transportation plans. A community's citizens have an intimate knowledge of the places where they live and travel and of the transportation problems they encounter. Accordingly, JBG has actively participated in the civic planning process, initiated by the City and led by a 12-member Advisory Group. This civic process has helped shape the design and character of the proposed redevelopment of North Potomac Yard. The Advisory Group provides guidance to City staff on the plan elements, specifically assisting in developing Small Area Plan principles regarding potential land uses, open space, sustainability, transportation and connectivity issues, and potential community benefits. The civic engagement process includes advisory group meetings (open to all members of the public), design charrettes and workshops, and City Commission and Council meetings.

1.4 EXECUTIVE SUMMARY

Site Location

Potomac Yard is located in the northeast corner of the City of Alexandria. Arlington County and Four-Mile Run are immediately to the north, the Potomac River is to the east, Old Town Alexandria is to the south, and the residential neighborhoods of Del Ray and Lynhaven are to the west. North Potomac Yard is shown in the regional context in **Figure 1-1**. Landbay F, North Potomac Yard, is located in the northern portion of Potomac Yard. Its location relative to other landbays of Potomac Yard is shown in **Figure 1-2**.

Description of Proposed Development

The approximately 7.5 million square feet of development analyzed in this transportation study for the Updated Plan for North Potomac Yard is broken down as follows:

- Hotel: 169,900 square feet (300 rooms)
- Office: +/- 2,850,500 square feet
- Residential Uses: +/- 3,574,600 square feet (3,365 dwelling units)
- Retail (930,000 Square feet)
    - 504,750 square feet anchor retail
    - 163,970 square feet inline retail
    - 116,280 square feet restaurant
    - 100,000 square feet gym
    - 45,000 square feet cinema

It is recognized that the land use scenarios contained in the subsequent development applications may vary in the type and location of density. The final build-out is expected to be within the order of magnitude of the densities that are the subject of this study and identified above. The proposed development of North Potomac Yard will replace the existing large-format retail, specialty retail, and movie theater that currently exists on the site.

It is noted that the transportation study prepared for the 2010 Plan originally assumed a 100 percent residential use in the flex zone (blocks 6 to 12 and 15 to 21) where the zoning allows the option for either office or residential use. It is also noted that no specific development phasing was prepared at the time of the 2010 Plan. Further, the 2010 Plan envisioned a future where Potomac Avenue was relocated to the east to become the easternmost street in the transportation network with all North Potomac Yard development occurring west of Potomac Avenue. These assumptions are replicated as part of the analysis of the 2010 plan in this study.

In comparison, the Updated Plan assumes a mix of office and residential use in the flex zone and anticipates a phased program of development for North Potomac Yard. Phase I of the development will occur primarily to the east of Potomac Avenue and will consist of approximately 1.3 million square feet of development. Phase I is planned to be built out by 2021. The remaining development is planned to be built and in use prior to 2040.

The Updated Plan also retains the current alignment of Potomac Avenue. This results in development occurring along both sides of Potomac Avenue (i.e. Potomac Avenue now runs north-south through the site). Retaining Potomac Avenue in its current alignment will allow the Metroway (i.e. dedicated bus rapid transit route) to run through the site and be more accessible to the entire development.

At least two Metroway stations are planned along Potomac Avenue and will provide service to the development. These stations will be designed to be consistent with or exceed the amenities offered at current Metroway stations.

Consistent with the 2010 Plan, the Updated Plan has been designed to incorporate and encourage the use of the planned Potomac Yard Metrorail station. This includes a pavilion area near the Metrorail station entrance east of Evans Lane in the Phase I area of the development. The Updated Plan has been designed to enhance the access to the station for pedestrians, bicyclists, buses, and vehicle drop-off.

The Updated Plan includes urban scale blocks with a sensitivity towards pedestrian access to transit (both Metroway and Metrorail). The Updated Plan has been designed to facilitate safe pedestrian circulation through the proposed provision of signalized intersections at regular intervals along Potomac Avenue, pedestrian signal heads, high visibility crosswalks, minimized crossing lengths while maintaining the desired traffic operations and dedicated transit corridors, as well as a defined sidewalk and trail network. The Updated Plan has also been deigned to incorporate signed or marked bike routes through the site, connectivity to the regional trail network, bicycle parking, and bike share stations to complement existing transit offerings. Access to open space and proposed area parks will be provided for both pedestrians and bicyclists.

The specific designs, infrastructure, and amenities with respect to non-auto travel will be determined in subsequent phases of the project.

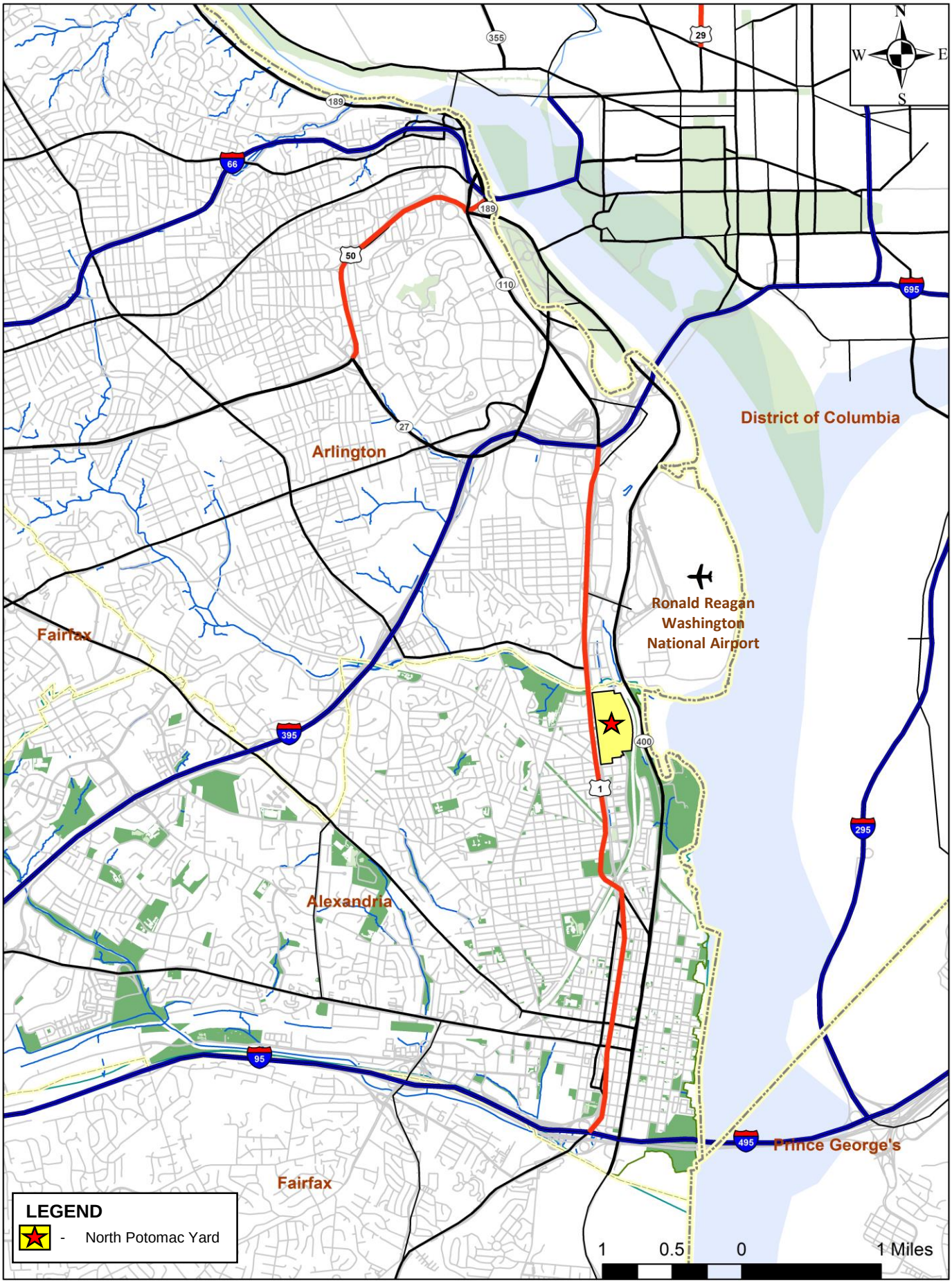


Figure 1-1: Regional Context Map

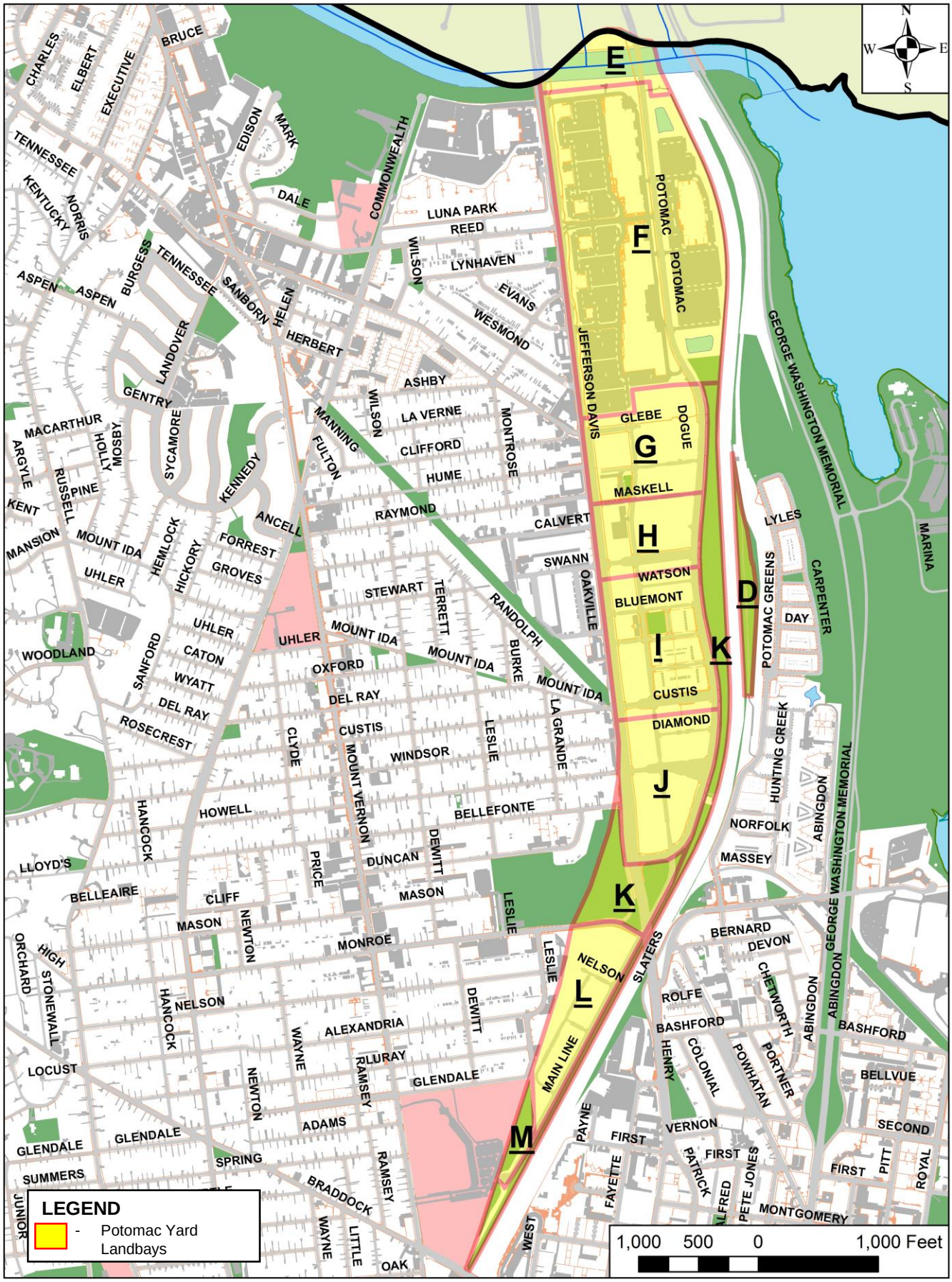


Figure 1-2: Potomac Yard Landbays

Study Methodology and Assumptions

This multimodal transportation study has been prepared to conform to the City of Alexandria's Transportation Planning Administrative Guidelines and VDOT's Traffic Impact Analysis Regulations. Scoping agreements were prepared to document specific assumptions and methodologies regarding the study. A copy of these scoping agreements is included in **Appendix A.**

Study Area

The study area includes all signalized intersections along US Route 1 between Slaters Lane and S. Glebe Road, all signalized intersections along Potomac Avenue between US Route 1 and the City/Arlington County line, additional signalized intersections to the west of US Route 1, and future site entrances along US Route 1 and Potomac Avenue. Existing study area intersections are shown in **Figure 1-3**.

Analysis Methodology

VISSIM 7 was the primary analysis package used for this study. All study area intersections along US Route 1 and Potomac Avenue were analyzed using VISSIM microsimulation. Measures of effectiveness (MOEs) for this study included average delay and level of service, average travel time, and average and maximum queue lengths. Study intersections not along US Route 1 or Potomac Avenue were analyzed using Synchro 9.1. Synchro MOEs included delay, level of service, and 95th percentile queue lengths. Per the City's Transportation Planning Administrative Guidelines, the use of VISSIM is preferred for streets that are approaching capacity (volume to capacity ratio greater than 0.85), for streets where queue spill back is a concern, or for streets where large vehicle or transit operations are prevalent. These conditions are all generally true along US Route 1 during the peak hours and both US Route 1 and Potomac Avenue (north of E. Glebe Road) have or are planned to have dedicated transit lanes

Existing Traffic Volumes

Traffic counts were conducted at the study area intersections in May and September 2016 between 6:30 AM and 9:30 AM and between 4:00 PM and 7:00 PM. Common network peak hours of traffic were calculated to be 7:15 AM to 8:15 AM for the morning peak and 4:45 PM to 5:45 PM for the afternoon peak. Peak hour traffic volumes, bicycle volumes, pedestrian volumes, peak hour factors, and heavy truck percentages were calculated at each intersection during network peak hours and incorporated into the analysis as appropriate. Existing traffic associated with the current uses of North Potomac Yard were determined based on the existing peak hour turning movement counts at select site driveways.

Figure 1-3: Existing Study Area Intersections

2021 Planned Background Future Improvements

The following are planned transportation improvements that are anticipated to be completed, open, and operational by 2021 without the proposed redevelopment.

- The Potomac Yard Metrorail Station - a new station for the regional Metrorail system is planned to be located east of Potomac Yard
- US Route 1 and E. Glebe Road intersection improvements - widening of the eastbound approach to include exclusive left-, through, and right-turn lanes; modification of the westbound approach to include exclusive left-turn lane and shared through-right turn lane
- US Route 1 and E. Swann Avenue intersection improvements - modification of the eastbound and westbound approaches to include exclusive left-turn lanes and shared through-right lanes
- Construction of a north-south road between Calvert Avenue and E. Glebe Road to further connect the redeveloped Oakville Triangle to E. Glebe Road
- Signalization of the intersection of US Route 1 and Montrose Avenue
- Signalization of the intersection of US Route 1 and Fannon Street for pedestrian crossings
- Traffic signal timing updates (cycle length, phasing, and offsets) to accommodate future traffic per ongoing City initiatives or develop related improvements
- Transit signal priority along US Route 1

2040 Planned Background Future Improvements

The following are planned transportation improvements that are anticipated to be completed, open, and operational by 2040 without the proposed redevelopment, in addition to the improvements already identified above:

- US Route 1 and E. Custis Avenue intersection improvements - modification of the eastbound and westbound approaches to include exclusive left-turn lanes and shared through-right turn lanes

Background Future Traffic Volumes

Background future traffic volumes include future traffic associated with the growth of regional through trips, trips generated by approved and unbuilt developments, and other minor diversions of traffic associated with one or more of the transportation improvements identified above. Traffic generated by North Potomac Yard under either the 2010 Plan or the Updated Plan is not considered part of the background future traffic volumes.

Despite the lack of apparent traffic increases along US Route 1 based on a review of historic annual average daily traffic (AADTs), a conservative one percent per year traffic growth factor was applied to the northbound and southbound US Route 1 through movements, up to a maximum increase of 10 percent. This one percent yearly growth factor is consistent with the growth factor used in previous transportation studies in the City, including the Oakville Triangle and Route 1 Corridor Plan, the Old Town North Small Area Plan Update, and the 2010 Plan. This growth is intended to reflect increases in traffic attributable to regional through trips, non-specific traffic growth in the City, and potential unknown developments near the US Route 1 corridor.

The City identified multiple approved and unbuilt developments near the study area. The vehicular peak hour trips generated by each development was considered in the analysis of background traffic.

The construction of a north-south road between Calvert Avenue and E. Glebe Road may lead to a redistribution of trips that use the intersections of US Route 1 and E. Glebe Road and of US Route 1 and Swann Avenue. Similarly, the signalization of Montrose Avenue may lead to a redistribution of trips between the intersections of US Route 1 and E. Glebe Road and of US Route 1 and Montrose Avenue. Minor diversions of traffic due to these improvements were considered in this study.

Additional Improvements with Development

The following is a planned transportation improvement that is anticipated to be completed, open, and operational by 2040 with significant redevelopment of the North Potomac Yard property.

- US Route 1 and E. Reed Avenue intersection improvements - improvement to the lane configuration at the intersection of US Route 1 and E. Reed Avenue to include an exclusive southbound right turn lane and the modification of the eastbound and westbound approaches to allow through movements
- Dedicated Metroway corridor along Evans Lane and Potomac Avenue. The timing of this improvement and the specific design elements will be determined at a later date

Multimodal Transportation Recommendations

In addition to the planned and programmed improvements, additional multimodal transportation recommendations have been identified as result of this study. Recommendations have been applied in this analysis for the 2010 Plan and the Updated Plan. These include:

- By 2021
  - Increase traffic signal cycle length to 160 seconds along US Route 1
  - Revise signal phasing and green times to provide the necessary green time for northbound and southbound through movements along US Route 1 as required for the heavy commuter orientation of the street, while providing the desired side street level of service.
  - Apply northbound/southbound lagging left turns along US Route 1 to improve progression
- By 2040
  - Consider coordinating the signals of US Route 1 and Potomac Avenue and Potomac Avenue and Main Line Boulevard to minimize queue build up at Main Line Boulevard
  - Lane configuration improvements at US Route 1 and Potomac Avenue to allow westbound vehicles to more efficiently turn from Potomac Avenue to US Route 1 southbound
  - Lengthen northbound and southbound left turn storage lanes along US Route 1 at select locations to minimize potential for turn lanes vehicle to be blocked by through vehicles or through lanes to be blocked by turning vehicles. Preliminarily, the intersections of US Route 1 and E. Glebe Road and with E. Reed Avenue have been identified for consideration

Baseline Future Traffic Volumes

Baseline future traffic volumes included the background future traffic volumes plus the traffic generated by North Potomac Yard using the development program of the 2010 Plan. In the context of this report, the Baseline future is referred to as the "2010 Plan." Vehicular trip generation was based on Institute of Transportation Engineers Trip Generation Manual (to calculate person trips) and mode split assumptions were based on a WMATA station area travel study (to convert person trips into trips by rail transit, trips by bus transit, trips on foot, trips by bike, and trips by personal vehicles). The mode split assumptions were consistent with those used in previous transportation studies in the City, including those for the Oakville Triangle and Route 1 Corridor Vision Plan, the Old Town North Small Area Plan Update, and the 2010 Plan.

Build Future Traffic Volumes

Build future traffic volumes included the background future traffic volumes plus the traffic generated by North Potomac Yard using the proposed development program of the Updated Plan. In the context of this report, the Build future is referred to as the "Updated Plan." Similar to the Baseline or 2010 Plan analyses, vehicular trip generation was based on Institute of Transportation Engineers Trip Generation Manual (to calculate person trips) and mode split assumptions were based on a WMATA station area travel study (to convert person trips into trips by rail transit, trips by bus transit, trips on foot, trips by bike, and trips by personal vehicles). The mode split assumptions were consistent with those used in previous transportation studies in the City, including the Oakville Triangle and Route 1 Corridor Vision Plan, the Old Town North Small Area Plan Update, and the 2010 Plan.

Principal Findings, Conclusions, and Recommendations

Existing Conditions – The overall intersection level of service summary for existing conditions is shown in **Table 1-1**. The analysis shows that all study intersections operate at an overall LOS D or better during both the AM and PM peak hours. The local street network to the west, north, and south of US Route 1, the developing grid network of streets in South Potomac Yard east of US Route 1, and the growing use of Potomac Avenue as a viable north-south alternative provide convenient opportunities for vehicle, pedestrian, bicycle, and transit travel. The interconnected network of streets also allows for the efficient dispersion of traffic, balancing the automobile pressures of US Route 1 and Potomac Avenue. This allows signalized and unsignalized intersections in the area to operate efficiently with minimal incentives to cut through neighborhood streets. It should be noted that there are side street approaches and movements that operate at LOS E or F. The US Route 1 corridor is an essential component of north-south movements in the City of Alexandria and the greater Northern Virginia region. In order to ensure its continued success as an alternate route to the I-95 corridor, as a connection between Fairfax County, Alexandria, and Arlington County, and as a transit-oriented corridor offering local and enhanced (Metroway) transit options, the City has prioritized the efficient operations of the north-south movements. This approach is typical in urban corridors.

Table 1-1: Existing Traffic Analysis Summary LOS and Delay (seconds/vehicle)		
Intersection	AM	PM
1. US Route 1 & S. Glebe Road	49.3 (D)	43.9 (D)
2. US Route 1 & Potomac Yard Driveway	12.5 (B)	31.1 (C)
3. US Route 1 & Luna Park Drive	3.5 (A)	4.8 (A)
4. US Route 1 & E. Reed Avenue	19.9 (B)	20.1 (C)
5. US Route 1 & Montrose Avenue	3.4 (A)	1.2 (A)
6. US Route 1 & Evans Lane	4 (A)	6.5 (A)
7. US Route 1 & E. Glebe Road	28.3 (C)	28.9 (C)
8. US Route 1 & Swann Avenue	8.5 (A)	8.1 (A)
9. US Route 1 & Fannon Street	-	-
10. US Route 1 & E. Custis Avenue	9.3 (A)	10.9 (B)
11. US Route 1 & E. Howell Avenue	6.7 (A)	9.5 (A)
12. US Route 1 & Potomac Avenue	10.8 (B)	12.1 (B)
13. US Route 1 and Slaters Lane	18.8 (B)	4.5 (A)
14. Potomac Avenue & E. Reed Avenue	5.4 (A)	2.1 (A)
15. Potomac Avenue & E. Glebe Road	7.8 (A)	4.7 (A)
16. Potomac Avenue & Swann Avenue	6.7 (A)	1.3 (A)
17. Potomac Avenue & E. Custis Avenue	8.4 (A)	3.2 (A)
18. Potomac Avenue & E. Howell Avenue	2.9 (A)	2.7 (A)
19. Potomac Avenue & Main Line Boulevard	14 (B)	21.6 (C)
20 Commonwealth Avenue & W./E. Glebe Road	B (15.1)	B (15.6)
21. Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue	D (38.5)	D (35.8)

Phase I Conditions (2021) – Future volumes were developed for Phase I of North Potomac Yard. Phase I considers the initial development of North Potomac Tard, to be completed by 2021, with the primary redevelopment in the location of the existing theatre site. The analysis of Phase I conditions includes the combined impacts of existing traffic plus the additional traffic generated by currently approved and unbuilt developments, regional traffic growth, programmed transportation improvements, minor signal timing updates, and traffic generated by Phase I of the North Potomac Yard in either the 2010 Plan or the Updated Plan. The analysis also considers the multimodal recommendations previously identified. The overall intersection level of service summary for Phase I conditions is shown in **Table 1-2.**

Similar to existing conditions analysis, Phase I conditions analyses indicate that most study intersections will continue to operate at LOS D or better. The exception to this is the intersection of S. Glebe Road and US Route 1 which operates at LOS F during the PM peak hour. It is noted that this intersection is within the boundaries of Arlington County. The intersection serves as a gateway between Arlington and Alexandria and is one of the final full access intersections prior to US Route 1 becoming essentially limited access to the north.

It is recognized that interjurisdictional cooperation would be needed to address the traffic impacts at the intersection of S. Glebe Road and US Route 1. The goal of this cooperation would be to prevent the intersection from becoming a bottleneck along US Route 1 and maintaining the desired progression of traffic in both Arlington County and the City.

The analysis results shown in **Table 1-2** also demonstrate that the Updated Plan results are generally consistent with the 2010 Plan results. Intersections along US Route 1 experience increases in delay with the Updated Plan conditions (typically less than six seconds); even with these delay increases, nearly all US Route 1 intersections operate at the same LOS under both the Updated Plan and 2010 Plan conditions except for the intersection of Slaters Lane and US Route 1. This intersection changes from LOS A to LOS B during the PM peak hour due to a 1.8 second increase in overall intersection delay, which will not be noticeable to the average driver.

Existing intersections along Potomac Avenue will generally operate with the same LOS when comparing the two plans; instances where the Updated Plan LOS are lower than the 2010 Plan LOS are due to a more detailed assignment of traffic through the grid network of streets. This still results in intersections operating at overall LOS of D or better during both the AM and PM peak hours. The new intersections (site entrances) will operate at an overall LOS D or better during the AM and PM peak hours under both the Updated Plan and the 2010 Plan. It is noted that the Updated Plan shows Potomac Avenue in its current alignment, with Phase I development occurring to the east of Potomac Avenue. The 2010 Plan considered Potomac Avenue to be relocated as the easternmost street in the area. This results in a different orientation of internal intersections with Potomac Avenue. As a result, the vehicle delays at these intersections will be slightly higher under the Updated Plan than in the 2010 Plan. It is noted that even with these delay increases under the Updated Plan, all internal Potomac Avenue intersection operate at LOS D or better, which is considered acceptable conditions.

The results show that the Updated Plan and the 2010 Plan have similar traffic impacts, and the specific mix and location of land uses in the Updated Plan results in traffic impacts that are consistent with those impacts previously approved by the City.

Table 1-2: 2021 Phase I Traffic Summary LOS and Delay (seconds/vehicle)						
Intersection	Existing		2010 Plan		Updated Plan	
	AM	PM	AM	PM	AM	PM
1. US Route 1 & S. Glebe Road	49.3 (D)	43.9 (D)	41.1 (D)	99 (F)	43.2 (D)	104.5 (F)
2. US Route 1 & Potomac Yard Driveway	12.5 (B)	31.1 (C)	8.8 (A)	27.4 (C)	9.4 (A)	28.4 (C)
3. US Route 1 & Luna Park Drive	3.5 (A)	4.8 (A)	4 (A)	17.1 (B)	4.2 (A)	16.5 (B)
4. US Route 1 & E. Reed Avenue	19.9 (B)	20.1 (C)	15.1 (B)	29.8 (C)	17.3 (B)	30.7 (C)
5. US Route 1 & Montrose Avenue	3.4 (A)	1.2 (A)	8.3 (A)	22.6 (C)	8.4 (A)	23.3 (C)
6. US Route 1 & Evans Lane	4 (A)	6.5 (A)	6.1 (A)	16.5 (B)	5.5 (A)	17.2 (B)
7. US Route 1 & E. Glebe Road	28.3 (C)	28.9 (C)	23 (C)	41.4 (D)	23.8 (C)	46.2 (D)
8. US Route 1 & Swann Avenue	8.5 (A)	8.1 (A)	24.9 (C)	23 (C)	24.3 (C)	24.3 (C)
9. US Route 1 & Fannon Street	-	-	1.5 (A)	2.4 (A)	1.4 (A)	2.3 (A)
10. US Route 1 & E. Custis Avenue	9.3 (A)	10.9 (B)	14.3 (B)	13.7 (B)	13.5 (B)	15.3 (B)
11. US Route 1 & E. Howell Avenue	6.7 (A)	9.5 (A)	12 (B)	15.8 (B)	11.6 (B)	17.6 (B)
12. US Route 1 & Potomac Avenue	10.8 (B)	12.1 (B)	28.9 (C)	15 (B)	29.5 (C)	17.6 (B)
13. US Route 1 & Slaters Lane	18.8 (B)	4.5 (A)	39.7 (D)	9.9 (A)	41.6 (D)	11.7 (B)
14. Potomac Avenue & E. Reed Avenue	5.4 (A)	2.1 (A)	4 (A)	7.3 (A)	9.3 (A)	29.7 (C)
15. Potomac Avenue & E. Glebe Road	7.8 (A)	4.7 (A)	7 (A)	8.2 (A)	8.1 (A)	23.7 (C)
16. Potomac Avenue & Swann Avenue	6.7 (A)	1.3 (A)	7.4 (A)	11.1 (B)	7.5 (A)	9.9 (A)
17. Potomac Avenue & E. Custis Avenue	8.4 (A)	3.2 (A)	5.5 (A)	5 (A)	5.7 (A)	4.7 (A)
18. Potomac Avenue & E. Howell Avenue	2.9 (A)	2.7 (A)	3.3 (A)	3.8 (A)	5.4 (A)	7.3 (A)
19. Potomac Avenue & Main Line Boulevard	14 (B)	21.6 (C)	16.6 (B)	22.4 (C)	17.3 (B)	26.5 (C)
20. Commonwealth Avenue & W/E. Glebe Road	B (15.1)	B (15.6)	14.8 (B)	15.7 (B)	15.1 (B)	16.1 (B)
21. Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue	D (38.5)	D (35.8)	39.0 (D)	E (59.2)	38.5 (D)	D (45.1)
32. Potomac Avenue & Livingston Avenue	-	-	0.7 (A)	2 (A)	1.9 (A)	13.9 (B)
33. Potomac Avenue & Tide Lock Avenue	-	-	9.4 (A)	9.2 (A)	7.9 (A)	17.8 (B)
34. Potomac Avenue & Silver Meteor Avenue	-	-	8.9 (A)	5 (A)	7.7 (A)	38.4 (D)
35. Potomac Avenue & Evans Lane	-	-	6.2 (A)	6.6 (A)	7.6 (A)	16.1 (B)
36. Potomac Avenue & Wesmond Drive	-	-	8.2 (A)	5.4 (A)	11.4 (B)	27.8 (C)
37. Tide Lock Avenue & Livingston Avenue	-	-	-	-	6.9 (A)	6.9 (A)
38. Retail Street & E. Reed Avenue	-	-	-	-	7.0 (A)	7.3 (A)
39. Retail Street & Silver Meteor Avenue	-	-	-	-	7.4 (A)	7.6 (A)
40. Retail Street & Evans Lane	-	-	-	-	7.1 (A)	7.3 (A)
41. Retail Street & Wesmond Drive	-	-	-	-	n/a	n/a

"-" - intersection not considered in current scenario

Full Build-Out Conditions (2040) – Future volumes were developed for the full build-out of North Potomac Yard. Full build-out considers the complete redevelopment of North Potomac Yard, to be completed by 2040, replacing the existing theatre site and shopping center. The analysis of full build-out conditions includes existing traffic plus the combined effects of the additional traffic generated by currently approved and unbuilt developments, regional traffic growth, programmed transportation improvements, minor signal timing updates, and traffic generated by the full build-out of North Potomac Yard in either the 2010 Plan or the Updated Plan. The analysis also considers the multimodal recommendations previously identified. The overall intersection level of service summary for full build-out conditions is shown in **Table 1-3.** Similar to existing and Phase I conditions analysis, the full build-out analyses indicate that most study intersections will continue to operate at LOS D or better. The exceptions to this include the intersections of US Route 1 with:

- S. Glebe Road (LOS F during PM peak hour for the 2010 and Updated Plans)
- Potomac Yard Driveway across the street from Alexandria Toyota (LOS E/F during PM peak hour for 2010/Updated Plan, respectively)
- Potomac Avenue (LOS E during PM peak hour for Updated Plan
- Slaters Lane (LOS E or F during AM and PM peak hours respectively for both the 2010 and Updated Plan)

It is noted that the S. Glebe Road intersection is within the boundaries of Arlington County. The intersection serves as a gateway between Arlington and Alexandria and is among the final full access intersections prior to US Route 1 becoming essentially limited access to the north. It is recognized that interjurisdictional cooperation would be needed to address the traffic impacts at the intersection of S. Glebe Road and US Route 1. The goal of this cooperation would be to prevent the intersection from becoming a bottleneck along US Route 1 and maintaining the desired progression of traffic in both Arlington County and the City.

It is also noted that as the City strives to achieve a balance of multimodal operations, with emphasis on the travel experience of pedestrians, bicyclists, transit riders, and motorists, in that order. An overall intersection LOS E is increasingly becoming acceptable for vehicle operations on the busiest urban corridors. Along US Route 1, the City may further investigate the appropriate operational balance to provide a desired level of service for all modes while maintaining the north-south progression of traffic that is essential to daily commuting patterns.

The analysis results demonstrate that transportation operations with the Updated Plan are generally consistent with the 2010 Plan results. Most intersections along US Route 1 and along Potomac Avenue experience incremental increases in delay with full build-out of the Updated Plan compared to the 2010 Plan. This is in part due the slightly greater number of trips generated by the Updated Plan and in part due to the more detailed assignment of traffic through the grid network of streets. The greater number of trips in the Updated plan is the result of the proposed reallocation of land uses in the Updated Plan to anticipate greater levels of office development compared to the 2010 Plan as well as the use of more specific land uses that was considered in the 2010 plan. Even with these delay increases, most intersections in the study area that operate better than LOS D under the 2010 Plan conditions will continue to do so under the Updated Plan.

Table 1-3: 2040 Full build-out Traffic Summary LOS and Delay (seconds/vehicle)						
Intersection	Existing		2010 Plan		Updated Plan	
	AM	PM	AM	PM	AM	PM
1. US Route 1 & S. Glebe Road	49.3 (D)	43.9 (D)	44 (D)	126.3 (F)	45.7 (D)	213.8 (F)
2. US Route 1 & Potomac Yard Driveway	12.5 (B)	31.1 (C)	9.1 (A)	59.9 (E)	18.5 (B)	87.2 (F)
3. US Route 1 & Luna Park Drive	3.5 (A)	4.8 (A)	5.8 (A)	16 (B)	9.9 (A)	20.4 (C)
4. US Route 1 & E. Reed Avenue	19.9 (B)	20.1 (C)	28.4 (C)	37.6 (D)	51.9 (D)	44.2 (D)
5. US Route 1 & Montrose Avenue	3.4 (A)	1.2 (A)	9.4 (A)	13.7 (B)	16.5 (B)	18.4 (B)
6. US Route 1 & Evans Lane	4 (A)	6.5 (A)	8.5 (A)	27.8 (C)	20.5 (C)	40.4 (D)
7. US Route 1 & E. Glebe Road	28.3 (C)	28.9 (C)	27.3 (C)	35.4 (D)	31.9 (C)	44.6 (D)
8. US Route 1 & Swann Avenue	8.5 (A)	8.1 (A)	25.8 (C)	37.4 (D)	31 (C)	42.1 (D)
9. US Route 1 & Fannon Street	-	-	2.2 (A)	10.1 (B)	2.4 (A)	10.4 (B)
10. US Route 1 & E. Custis Avenue	9.3 (A)	10.9 (B)	13 (B)	40.6 (D)	18.1 (B)	46 (D)
11. US Route 1 & E. Howell Avenue	6.7 (A)	9.5 (A)	11.9 (B)	36.7 (D)	15.3 (B)	41.6 (D)
12. US Route 1 & Potomac Avenue	10.8 (B)	12.1 (B)	46.8 (D)	49.5 (D)	42 (D)	61.1 (E)
13. US Route 1 and Slaters Lane	18.8 (B)	4.5 (A)	87.7 (F)	57.3 (E)	77.8 (E)	87.6 (F)
14. Potomac Avenue & E. Reed Avenue	5.4 (A)	2.1 (A)	6.3 (A)	21.9 (C)	8.2 (A)	15.4 (B)
15. Potomac Avenue & E. Glebe Road	7.8 (A)	4.7 (A)	12.2 (B)	19.8 (B)	12 (B)	17.1 (B)
16. Potomac Avenue & Swann Avenue	6.7 (A)	1.3 (A)	7.5 (A)	14.5 (B)	8.5 (A)	14.8 (B)
17. Potomac Avenue & E. Custis Avenue	8.4 (A)	3.2 (A)	7.7 (A)	8.9 (A)	10.2 (B)	6.6 (A)
18. Potomac Avenue & E. Howell Avenue	2.9 (A)	2.7 (A)	4.8 (A)	16.4 (B)	8.6 (A)	11 (B)
19. Potomac Avenue & Main Line Boulevard	14 (B)	21.6 (C)	18.7 (B)	44.4 (D)	19.9 (B)	46.2 (D)
20. Commonwealth Avenue & W./E. Glebe Road	B (15.1)	B (15.6)	19.3 (B)	23.4 (C)	21.4 (C)	24. (C)
21. Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue	D (38.5)	D (35.8)	38.5 (D)	39.6 (D)	38.5 (D)	39.6 (D)
22. US Route 1 & Livingston Avenue	-	-	0.4 (A)	1 (A)	0.5 (A)	1.8 (A)
23. US Route 1 & Tide Lock Avenue	-	-	0.9 (A)	0.8 (A)	0.9 (A)	1.3 (A)
24. US Route 1 & Silver Meteor Avenue	-	-	3.7 (A)	18.7 (C)	5.9 (A)	23.7 (C)
25. US Route 1 & Wesmond Drive	-	-	0.6 (A)	8.8 (A)	6.7 (A)	16.2 (C)
26. Main Line Boulevard & Livingston Avenue	-	-	-	-	7.2 (A)	7.6 (A)
27. Main Line Boulevard & Tide Lock Avenue	-	-	-	-	5.0 (A)	7.3 (A)
28. Main Line Boulevard & E. Reed Avenue	-	-	-	-	4.8 (A)	7.3 (A)
29. Main Line Boulevard & Silver Meteor Avenue	-	-	-	-	13.3 (B)	43.0 (D)
30. Main Line Boulevard & Evans Lane	-	-	-	-	19.7 (B)	10.7 (B)
31. Main Line Boulevard & Wesmond Drive	-	-	-	-	15.1 (C)	25.5 (D)
32. Potomac Avenue & Livingston Avenue	-	-	9.7 (A)	97.3 (F)	7.6 (A)	13.2 (B)
33. Potomac Avenue & Tide Lock Avenue	-	-	9.1 (A)	34.1 (C)	8.3 (A)	19.2 (B)
34. Potomac Avenue & Silver Meteor Avenue	-	-	21.7 (C)	22.3 (C)	28.8 (C)	27.4 (C)
35. Potomac Avenue & Evans Lane	-	-	7.1 (A)	9.5 (A)	11 (B)	14.6 (B)
36. Potomac Avenue & Wesmond Drive	-	-	4.5 (A)	5.9 (A)	14.1 (B)	11.2 (B)
37. Tide Lock Avenue & Livingston Avenue	-	-	-	-	6.9 (A)	6.9 (A)
38. Retail Street & E. Reed Avenue	-	-	-	-	6.9 (A)	7.0 (A)
39. Retail Street & Silver Meteor Avenue	-	-	-	-	7.3 (A)	7.3 (A)
40. Retail Street & Evans Lane	-	-	-	-	6.8 (A)	7.1 (A)
41. Retail Street & Wesmond Drive	-	-	-	-	n/a	n/a

"-" - intersection not considered in current scenario

The right-in, right-out site entrances along US Route 1 will operate with acceptable levels of service (generally LOS A with one instance of LOS C) under both plans.

The new intersections (site entrances) along Potomac Avenue will operate at an overall LOS C or better during the AM and PM peak hours under both the Updated Plan and the 2010 Plan. It is noted that the Updated Plan shows Potomac Avenue in its current alignment. Phase I development will primarily occur to the east of Potomac Avenue while full build-out will occur both east and west of Potomac Avenue. The 2010 Plan considered Potomac Avenue to be relocated as the easternmost street in the area. This results in a different orientation of internal intersections with Potomac Avenue. As a result, the vehicle delays at these intersections will be slightly more under the Updated Plan than in the 2010 Plan.

Overall Conclusions and Recommendations – The results show that the two plans have similar traffic impacts, and the specific mix and location of land uses in the Updated Plan results in traffic impacts that are consistent with the impacts that were previously approved by the City.

The results discussed in the preceding section may be achieved and improved upon if the City pursues a comprehensive transportation strategy that facilitates significant mode shift from private autos to alternative, more sustainable means of transportation, consistent with the Transportation Master Plan and Environmental Action Plan 2030.

The appropriate investment in transportation infrastructure, which includes lane configuration updates, minor widening at specific side street approaches, and left turn lane storage extensions at select locations should be pursued. These should be done in combination with the many planned, programmed, and proffered transportation improvements in order to enhance vehicle traffic operations while providing additional transit access and accommodating an expansive pedestrian and bicycle network.

Other operational improvements such as transit signal priority and traffic signal retiming and coordination will help to mitigate the impacts of increased traffic volumes. The City may further investigate the appropriate phasing and implementation of such efforts in response to traffic conditions in the area.

The preceding recommendations are consistent with those developed for the 2010 Plan. The Updated Plan will result in a transportation condition that is similar to the one previously considered and approved by the City and VDOT. Through a comprehensive civic engagement process, JBG and the City have delivered an Updated Plan that addresses a more detailed land use and transportation scenario than analyzed as part of the 2010 plan. The resulting Updated Plan recommendations are similar to the 2010 plan recommendations and prioritize pedestrians and bicyclists, consistent with the City's Master Transportation Plan, while still considering other modes of transportation.

The Updated Plan will include urban scale blocks, sidewalks and pedestrian friendly landscaping treatments, traffic signals at regular intervals, high visibility crosswalks, and other amenities to encourage safe and accessible pedestrian movements through the site.

The Updated Plan will include a mixture of on-street and off-street bicycle facilities to link activity centers in the plan area with the regional bike and trail networks. Consideration will also be given for bicycle parking, bikeshare, and bicycle movements at signalized intersections in order to further support comfort for biking through North Potomac Yard.

The Updated Plan will integrate the proposed Metrorail station, providing access to regional rail travel for local bus transit riders, pedestrians and cyclists. The Updated Plan will also support local bus with stops along plan area streets and Metroway enhanced transit with dedicated lanes and stations along plan area streets.

Transportation in North Potomac Yard will be oriented to provide appropriate, safe, and accessible travel by pedestrians, bicyclists, transit riders, and motorists, in that order. With this vision, North Potomac Yard will become the next important regional destination in the City of Alexandria.

2. Background Information

2.1 PROJECT STUDY AREA

Potomac Yard is located in the northeast corner of the City of Alexandria. Arlington County and Four-Mile Run are immediately to the north, the Potomac River is to the east, Old Town Alexandria is to the south, and the residential neighborhoods of Del Ray and Lynhaven are to the west. Potomac Yard is shown in the regional context in **Figure 1-1**. Landbay F (herein referred to as North Potomac Yard) is located in the norther portion of Potomac Yard. Its location relative to other Landbays in Potomac Yard is shown in **Figure 1-2.**

2.2 DESCRIPTION OF ON-SITE DEVELOPMENT

The 69-acre North Potomac Yard currently supports a 600,000-square retail shopping center that includes specialty retail, large format retail, and a theatre. **Figure 2-1** shows the existing Potomac Yard retail center. The proposed development of North Potomac Yard will replace the existing development on the site. The 2010 Small Area Plan (herein referred to as the 2010 Plan) imagined a redevelopment of North Potomac Yard that reflected plan principles such as environmental and economic sustainability, design excellence, vibrant and diverse mixed-uses, comprehensive multimodal transportation, quality streetscape and useable open spaces, and connections and transitions appropriate to the surrounding neighborhoods. The 2010 Plan established the following land uses:

- Office: 1,930,000 square feet
- Retail: 930,000 square feet
- Residential: 1,100,000 square feet
- Flex (Office or Residential): 3,395,000 square feet
- Hotel 170,000 square feet
- Open Space: 152,460 square feet

As part of the Updated Plan, JBG has reaffirmed the vision for North Potomac Yard. The redevelopment will transform Potomac Yard Center from an auto-oriented, single-use center to a vibrant, pedestrian-oriented, mixed-use neighborhood. This vision is consistent with 2010 Plan principles. JBG has proposed the following updated mix of uses:

- Hotel: 169,900 square feet (300 rooms)
- Office: +/- 2,850,500 square feet
- Residential Uses: +/- 3,574,600 square feet (3,365 dwelling units)
- Retail: 930,000square feet
    - 504,750 square feet anchor retail
    - 163,970 square feet inline retail
    - 116,280 square feet restaurant
    - 100,000 square feet gym
    - 45,000 square feet cinema
- Open Space: not tallied

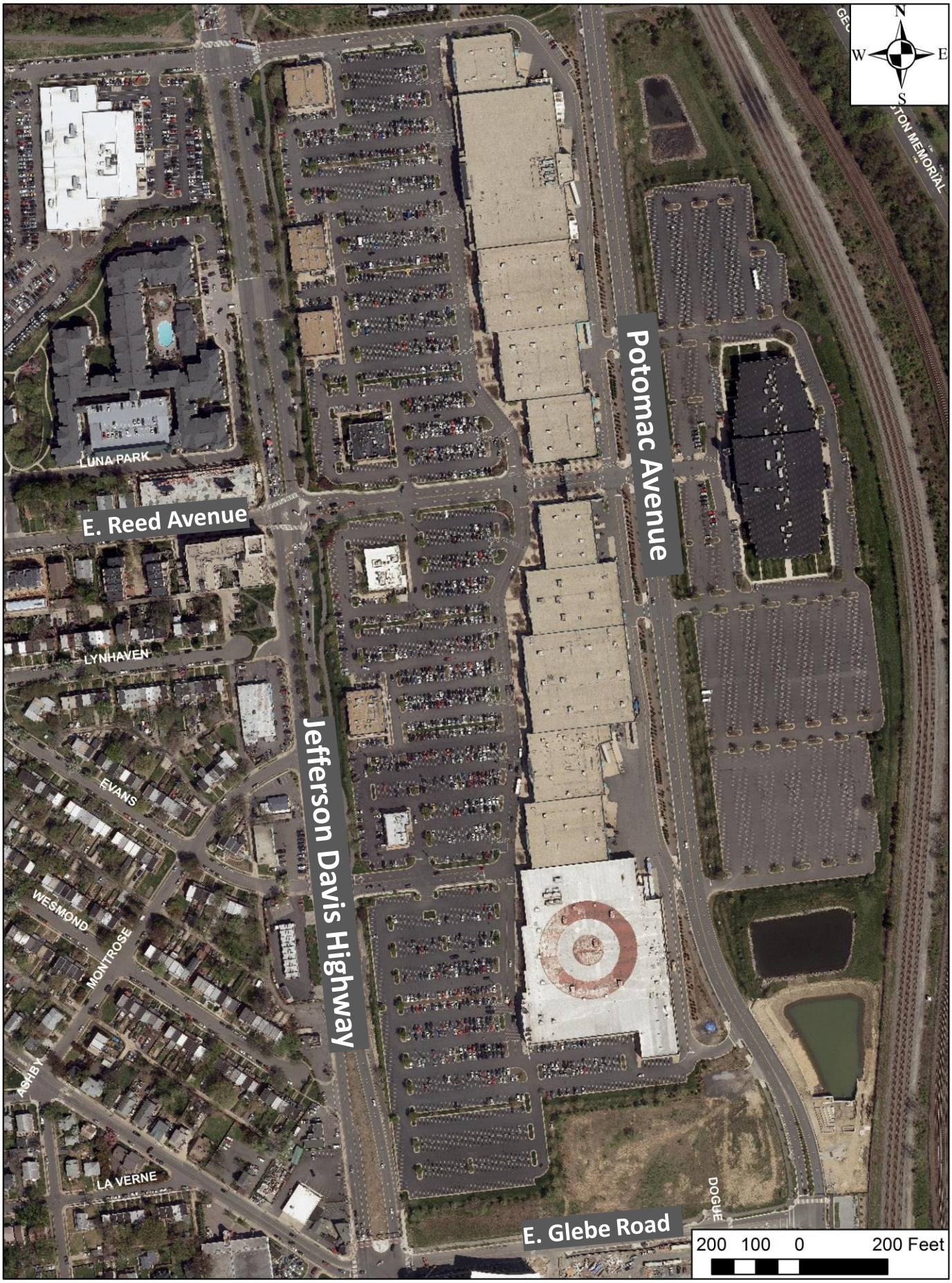


Figure 2-1: Existing Potomac Yard Retail Center

It is recognized that the land use scenarios contained in the subsequent development applications may vary in the type and location of density. The final build-out is expected to be within the order of magnitude of the densities that are the subject of this study and identified above.

It is noted that the transportation study prepared for the 2010 Plan originally assumed a 100 percent residential use in the flex zone (blocks 6 to 12 and 15 to 21) where the zoning calls for either office or residential). It is also noted that no specific development phasing was prepared at the time of the 2010 Plan. Further, the 2010 Plan envisioned a future where Potomac Avenue was relocated to the east to become the easternmost street in the transportation network with all North Potomac Yard development occurring west of Potomac Avenue. These assumptions are replicated as part of the analysis of the 2010 plan in this study. In comparison, the Updated Plan retains the current alignment of Potomac Avenue. This results in development occurring along both sides of Potomac Avenue (i.e. Potomac Avenue now runs north-south through the site).

As part of the creation of a unique and livable place through the Updated Plan, JBG has revisited the layout and focus of the North Potomac Yard neighborhoods, relocating certain land uses to blocks that are in closer proximity to the future planned Potomac Yard Metrorail Station. Based on market research and the City's planning goals, JBG has proposed a reallocation of land uses in the Updated Plan to anticipate greater levels of office development compared to the 2010 Plan. The change is proposed to occur in the "flex zone" with a two-third to one-third split between residential and office gross square feet.

Retaining Potomac Avenue in its current alignment will allow the Metroway to run through the site and be more accessible to the entire development. At least two Metroway stations are planned along Potomac Avenue and will provide service to the development. These stations will be designed to be consistent with or exceed the amenities offered at current Metroway stations. Consistent with the 2010 Plan, the Updated Plan has been designed to incorporate and encourage the use of the planned Potomac Yard Metrorail station. This includes a pavilion area near the Metrorail station entrance east of Evans Lane in the Phase I area of the development. The Updated Plan has been designed to enhance the access to the station for pedestrians, bicyclists, buses, and vehicle drop-off.

The Updated Plan includes urban scale blocks with a sensitivity towards pedestrian access to transit (both Metroway and Metrorail). The Updated Plan has been designed to facilitate safe pedestrian circulation through the proposed provision of signalized intersections at regular intervals along Potomac Avenue, pedestrian signal heads, high visibility crosswalks, minimized crossing lengths while maintaining the desired traffic operations and dedicated transit corridors, as well as a defined sidewalk and trail network. The Updated Plan has also been designed to incorporate signed or marked bike routes through the site, connectivity to the regional trail network, bicycle parking, and bike share stations to complement existing transit offerings. Access to open space and proposed area parks will be provided for both pedestrians and bicyclists.

The specific designs, infrastructure, and amenities with respect to non-auto travel will be determined in subsequent phases of the project.

JBG currently envisions a phased program of development for North Potomac Yard. Phase I of the development will occur primarily to the east of Potomac Avenue and include approximately 1.3 million square feet of development. Phase I is planned to be built out by 2021. The remaining development is planned to be built and in use prior to 2040. A representative concept plan for Phase I and full build-out of North Potomac Yard are shown on **Figure 2-2** and **Figure 2-3**, respectively.

2.3 DESCRIPTION OF NEARBY USES

North Potomac Yard is bordered by residential, commercial, industrial, and institutional land uses. The existing zoning near North Potomac Yard is shown in **Figure 2-4**.

	COMMERCIAL		HOTEL		RESIDENTIAL	
	RETAIL	OFFICE	AREA	ROOMS	AREA	UNITS
BLOCK 4*	SCHOOL SITE					
BLOCK 7	31,600				240,350	232
BLOCK 10/14	35,950				328,575	314
BLOCK 15	62,900					
BLOCK 18	20,300				205,950	191
BLOCK 19	117,800					
BLOCK 20	18,500	141,400	87,100	150		
BLOCK 8/11 (NEW RETAIL)	11,600					
SUBTOTAL BY USE	298,650	141,400	87,100	150	774,875	737
SUBTOTAL	440,050		87,100		774,875	
TOTAL	1,302,025					

* PER CDD: BLOCK 4 RESERVED FOR SCHOOL SITE

THE JBG COMPANIES

POTOMAC YARD | PARCEL ONE REDEVELOPMENT
GROUND LEVEL PLAN + YIELDS

DRAFT

streetsense.
October 20, 2016

Figure 2-2: Phase I Illustrative Concept Plan

THE JBG COMPANIES

POTOMAC YARD | PARCEL ONE REDEVELOPMENT
FULL BUILDOUT PLAN + BLOCK YIELD ESTIMATES

DRAFT

streetsense.
October 20, 2016

Figure 2-3: Full Build-Out Illustrative Concept Plan

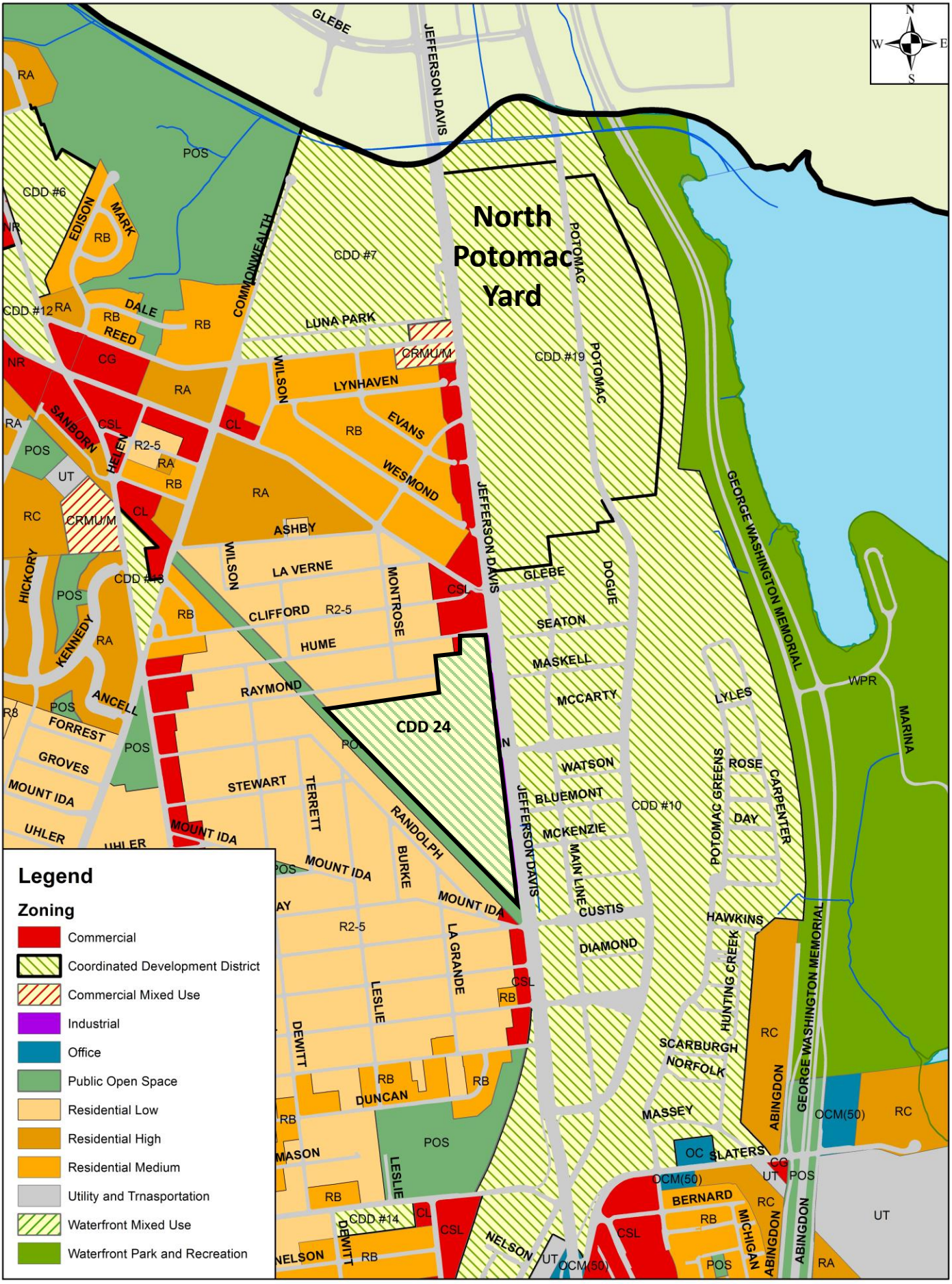


Figure 2-4: Existing Study Area Zoning

3. Analysis of Existing Conditions

3.1 OVERVIEW

This chapter examines the existing multimodal transportation conditions in the North Potomac Yard study area. Included are descriptions of the existing transportation network, transit operations, and pedestrian/bicycle amenities.

3.2 STREET NETWORK

The existing street network examined as part of this study includes major roadways such as US Route 1, E. Glebe Road, S. Glebe Road, E. Reed Avenue, Potomac Avenue, and Slaters Lane as well as the local street grid in the Del Ray, Lynhaven, and South Potomac Yard neighborhoods. The following is a brief description of the area street system, study intersections, and intersection operations.

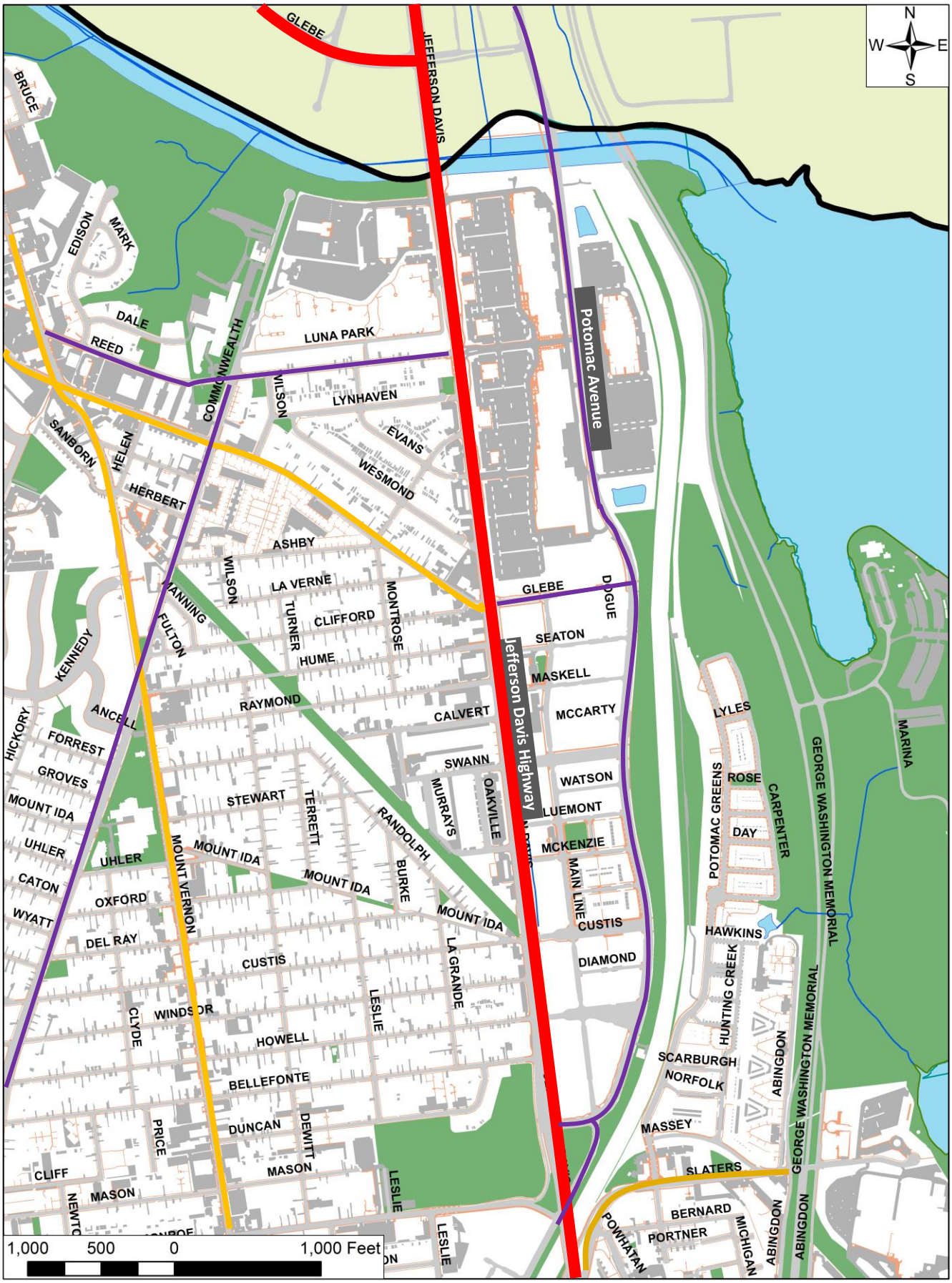
Study Area Streets

Functional Classifications

Alexandria uses a functional classification system to characterize its streets based on connectivity and access. The classifications align with the functional classifications of the Federal Highway Administration (FHWA) and VDOT. Alexandria's street system consists of expressways, arterials, primary collectors, residential collectors, and local streets:

- **Expressways** are controlled access facilities and provide movement for high volumes of people and goods over long distances. They do not provide access to adjacent properties.
- **Arterials** serve as primary links in Alexandria and to surrounding communities. Access is provided to adjacent land on a limited basis. Measures such as preferential signalization, signal progression, and linear continuity are provided on these streets. Arterials also may provide dedicated transit lanes.
- **Primary Collectors** provide access to major adjacent properties such as neighborhood shopping centers, mixed use hubs, and high schools. Primary collectors carry a mix of local and long-distance travel and provide a link between arterials.
- **Residential Collectors** carry relatively short trips and a large percentage of residential trips. They provide direct service to residential areas, local parks, neighborhoods, businesses, and schools. They connect local streets to higher classified streets.
- **Local Streets** provide direct access to homes, shopping, businesses, and other adjacent land. The local streets connect to collector streets. Cut through traffic on local streets should be discouraged.

The classification of streets in the study area (per VDOT standards) is shown on **Figure 3-1**.



LEGEND

- Other Principal Arterial
- Minor Arterial
- Major Collector

Figure 3-1: Functional Classification of Streets

Complete Street Typologies

The City has recently completed the Complete Streets Design Guidelines in conjunction with the update to the Bicycle and Pedestrian chapter of the Transportation Master Plan. The guidelines serve as a vision for the use, design, and character of City streets. Included within the guidelines are discussion of complete street typologies, defined by existing and planned street character and adjacent land use. The following complete street typologies provide a roadmap for how street design may evolve or change as redevelopment occurs or as new streets are developed:

- **Commercial Connectors** typically serve employment and entertainment centers, civic, commercial, and institutional land uses. These streets are currently dominated by motor vehicle traffic and have less pedestrian and bicycle activity.
- **Main Streets** serve small and medium sized businesses, restaurants, civic buildings or residences. Regardless of location or density, buildings are generally located close to the street. In their present form, these streets already have significant pedestrian and bicycle activity and typically offer on-street parallel parking.
- **Mixed-Use Boulevards** serve areas that generally have taller (five stories or more) buildings that house a mix of retail, residential, office and entertainment uses. Mixed Use Boulevards may be located in areas that have specific design requirements for finishes, materials, furnishings and lighting. In their present form, these streets already have pedestrian and bicycle activity, in addition to frequent parking turnover and higher traffic volumes. Mixed Use Boulevards are usually located near transit stations and as such are frequently key routes in the transit network.
- **Neighborhood Connectors** primarily serve residential land uses, though some businesses may be integrated into the street fabric. These streets have longer blocks and often serve faster moving traffic. Neighborhood Connectors are currently dominated by motor vehicles, but also have a strong need to accommodate and encourage pedestrian and bicycle activity. These streets often have bus stops and are key routes in the transit network.
- **Neighborhood Residential** streets serve residential areas with low levels of motor vehicle traffic. Pedestrian and bicycle activity is common along these streets. Most, but not all, neighborhood residential streets in Alexandria have sidewalks and offer on-street parking.
- **Parkways** extend through or along natural areas or large parks where there is a desire to maintain or create a park-like feel to the street.
- **Industrial Streets** serve industrial corridors and are built to accommodate commercial trucks. While there may be fewer pedestrians and bicyclists in these locations, these streets may also serve as through routes to adjacent uses.
- **Shared Streets** provide a single grade or surface that is shared by people using all modes of travel at extremely low speeds. They are often curbless and the sidewalk is blended with the travel way.

Complete street typologies supplement the traditional functional classification system and provide a more nuanced approach to characterize the diverse uses and functions of City streets. As North Potomac Yard redevelops, the complete street typologies will provide guidance during the selection of street design elements, traffic character, and the visioning process for the Small Area Plan.

Street Descriptions

US Route 1 is a north-south arterial that connects Alexandria to the Metropolitan Washington Region. To the north, US Route 1 connects to Arlington County, Washington, D.C., and Maryland. To the south, US Route 1 connects to Old Town Alexandria, Fort Belvoir, and Richmond. US Route 1 generally parallels I-95 along the entire Eastern seaboard. In the study area, US Route 1, also referred to as Jefferson Davis Highway, typically has 2 general purpose lanes and one dedicated transit lane in each direction (south of E. Glebe Road and in Crystal City) with traffic signals and left-turn lanes at major intersections. In the study area, the posted speed limit is 35 miles per hour (mph). South of the study area, Route 1 has a speed limit of 25 mph. US Route 1 is part of the National Highway System (NHS). Any improvements to US Route 1 should meet NHS level of service standards.

Potomac Avenue is a north-south primary collector route that connects US Route1 to the south with Crystal Drive to the north and provides additional north/south capacity for local and non-local trips. Potomac Avenue is located east of and is parallel to US Route 1. In the study area, south of E. Glebe Road, Potomac Avenue has a four-lane divided cross-section and accommodates on-street parking on one or both sides. North of E. Glebe Road, Potomac Avenue is a four-lane undivided street. The posted speed limit is 25 mph.

Commonwealth Avenue is a north-south primary collector street between Reed Avenue and King Street. Between Reed Avenue and Ashby Street, it has a two-lane divided cross-section with on-street parking and bike lanes on both sides of the street. Between Ashby Street and Mt. Vernon Avenue, Commonwealth Avenue has a two-lane undivided cross-section. The posted speed limit is 25 mph.

Mt. Vernon Avenue is a north-south arterial between Commonwealth Avenue and E. Braddock Road. North of Commonwealth Avenue, Mt. Vernon Avenue is a primary collector street. Mt. Vernon Avenue is an important corridor for the Del Ray community of the City of Alexandria. In the study area, it has a two-lane undivided cross-section with on-street parking. The posted speed limit is 25 mph.

E. Reed Avenue is an east-west residential collector connecting Mt. Vernon Avenue and US Route 1 in the Del Ray community of the City. In the study area, E. Reed Avenue has a two-lane undivided cross-section with on-street parking on one or both sides of the street. The posted speed limit is 25 mph

E. Glebe Road is an east-west primary collector connecting to S. Glebe Road and S. Four Mile Run Drive in Arlington County and US Route 1 in Alexandria. In the study area, E. Glebe Road has a two-lane undivided cross-section, bicycle lanes or shared lane marking in one or both directions, and accommodates on-street parking on one or both sides. The posted speed limit is 25 mph.

Monroe Avenue is an east-west primary collector street between Mt. Vernon Avenue and US Route 1. Monroe Avenue provides an important connection between Russell Road and US Route 1. In the study area, E. Monroe Avenue has a two-lane undivided cross-section with on-street parking. The posted speed limit is 25 mph.

Slaters Lane is an east-west minor arterial connecting US Route 1 to Old Town North. In the study area, Slaters Lane has a four-lane divided cross-section. The posted speed limit is 25 mph.

Montrose Avenue, Evans Lane, Luna Park Drive, Swann Avenue, Fannon Street, Custis Avenue, and *Howell Avenue* are all classified as local streets. These streets provide access to the Del Ray and Lynhaven neighborhoods. Between Commonwealth Avenue, Mt. Vernon Avenue, and US Route 1, these roads generally have a two-lane undivided cross-section with on-street parking.

Main Line Boulevard is a local north-south street located to the east of Route 1 and to the west of Potomac Avenue, with a connection to E. Monroe Avenue. This street currently extends between Potomac Avenue and E. Glebe Road.

Study Intersections

Existing intersections identified for analysis of traffic impacts include:

1. US Route 1 & S. Glebe Road
2. US Route 1 & Potomac Yard Driveway
3. US Route 1 & Luna Park
4. US Route 1 & E. Reed Avenue
5. US Route 1 & Montrose Avenue
6. US Route 1 & Evans Lane
7. US Route 1 & E. Glebe Road
8. US Route 1 & Swann Avenue
9. US Route 1 & Fannon Street
10. US Route 1 & E. Custis Avenue
11. US Route 1 & E. Howell Avenue
12. US Route 1 & Potomac Avenue
13. US Route 1 and Slaters Lane
14. Potomac Avenue & E. Reed Avenue
15. Potomac Avenue & E. Glebe Road
16. Potomac Avenue & Swann Avenue
17. Potomac Avenue & E. Custis Avenue
18. Potomac Avenue & E. Howell Avenue
19. Potomac Avenue & Main Line Boulevard
20. Commonwealth Avenue & W./E. Glebe Road
21. Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue

Each existing study intersection is signalized with the exception of the intersection of US Route 1 and Montrose Avenue and the intersection of US Route 1 and Fannon Street. These two intersections are proposed to be signalized in the future as part of transportation improvements that were previously identified by the City. The existing lane uses at the study intersections are shown in **Figure 3-2**. Where lane use markings or signs are not provided in the field, the lane designations used in this report represent observed operational conditions.

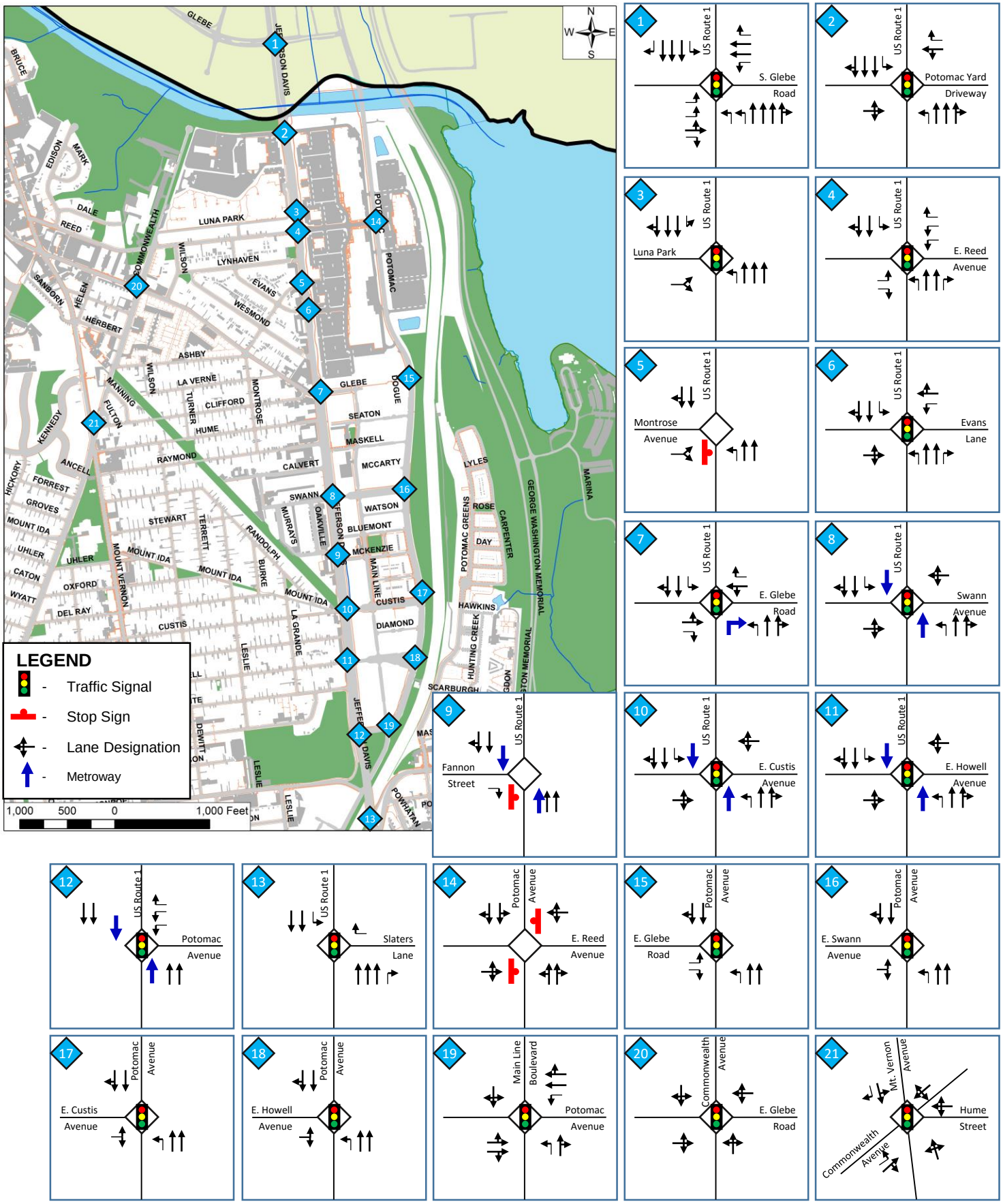


Figure 3-2: Existing Lane Designations

3.3 TRANSIT NETWORK

The study area is directly served by local and express bus services. The study area also is served indirectly by Metrorail and Virginia Railway Express. Existing transit services are described in the following section:

Metrorail Services: The US Route 1 Corridor area is served indirectly by the Yellow and Blue lines via the Crystal City and Braddock Road stations. The Braddock Road station currently has short-term vehicle parking, bicycle parking, and car sharing available in addition to being served by Metrobus and DASH. The Crystal City station currently has bicycle parking and car sharing available in addition to being served by Metrobus and ART. A future Metrorail station is planned east of Potomac Yard. The Metrorail station will be accessible near E. Glebe Road, from the North Potomac Yard development, and from Potomac Greens. The station is intended to be an urban station with limited vehicle drop-off.

Metrobus: Routes in the vicinity of the study area are listed below. Many of the routes identified below do not currently travel through North Potomac Yard. Modifications to bus routings to provide more service to North Potomac Yard is expected to occur with any meaningful redevelopment.

Metrobus Routes 10A, 10E (Hunting Point-Pentagon Line) provides service between Hunting Pont, Braddock Road Metrorail station, Crystal City, and the Pentagon Metrorail station. Through the study area, Routes 10A, 10E, and 10R provide service along Mt. Vernon Avenue. Route 10A provides service every weekday, Saturday, and Sunday at approximately 30-minute headways.

Metrobus Route 10B (Hunting Towers-Ballston Line) provides service between Hunting Towers, Braddock Road Metrorail station, Shirlington, and the Ballston-MU Metrorail station. Through the study area, Route 10B provides service along Mt. Vernon Avenue on weekdays, Saturdays, and Sundays at approximately 30-minutre headways.

Metrobus Route 11Y (Mt. Vernon Express Line) provides service from Mt. Vernon to Potomac Park in the District of Columbia. Through the study area, Route 11Y runs along the George Washington Memorial Parkway. This is an express service running northbound during the weekday AM peak period and southbound during the PM peak period every 15 to 20 minutes. The number of stops is restricted to reduce travel times.

Metroway (MWY) provides transit trips between the Crystal City and Braddock Road Metrorail stations. Along US Route 1, the Metroway runs along dedicated center lanes between Slaters Lane and E. Glebe Road. The service features dedicated bus-only lanes, consolidated bus stops, and enhanced transit service, seven days a week. During commuter peak hours, buses typically run every six minutes. Buses run every 12 minutes during daytime off-peak hours and every 15 minutes in the evening. On weekends, buses run every 20 minutes. A new stop is planned in the near future at the intersection of First Street and N. Fayette Street south of the study area.

DASH routes in the study area are the following:

Route AT9 provides service between the Potomac Yard shopping center and the King Street Metrorail Station. Through the study area, Route AT10 runs along E. Reed Avenue, Mt. Vernon Avenue, Monroe Avenue, and Commonwealth Avenue.

Route AT10 provides service between the Potomac Yard shopping center and the King Street Metrorail Station. Through the study area, Route AT10 runs along Reed Avenue, Mt. Vernon Avenue, Monroe Avenue, and Commonwealth Avenue.

DOT is the City of Alexandria's specialized transportation service for residents of the City of Alexandria and visitors who cannot use regular transit buses or rail due to disability. Taxicabs and wheelchair-accessible vans provide the service. DOT provides service throughout the City of Alexandria, City of Falls Church, Arlington County, Fairfax County, and Fairfax City. The service operates seven days a week during the following times: 5:30 AM to midnight Monday to Thursdays, 5:30 AM to 3:00 AM Fridays, 6:30 AM to 3:00 AM Saturdays, and 7:00 AM to midnight Sundays.

Existing transit services are shown in **Figure 3-3**.

3.4 EXISTING BICYCLE AND PEDESTRIAN MOBILITY

There are numerous existing pedestrian and bicycle facilities located in the study area. A summary of these facilities is described below.

Bicycle Network

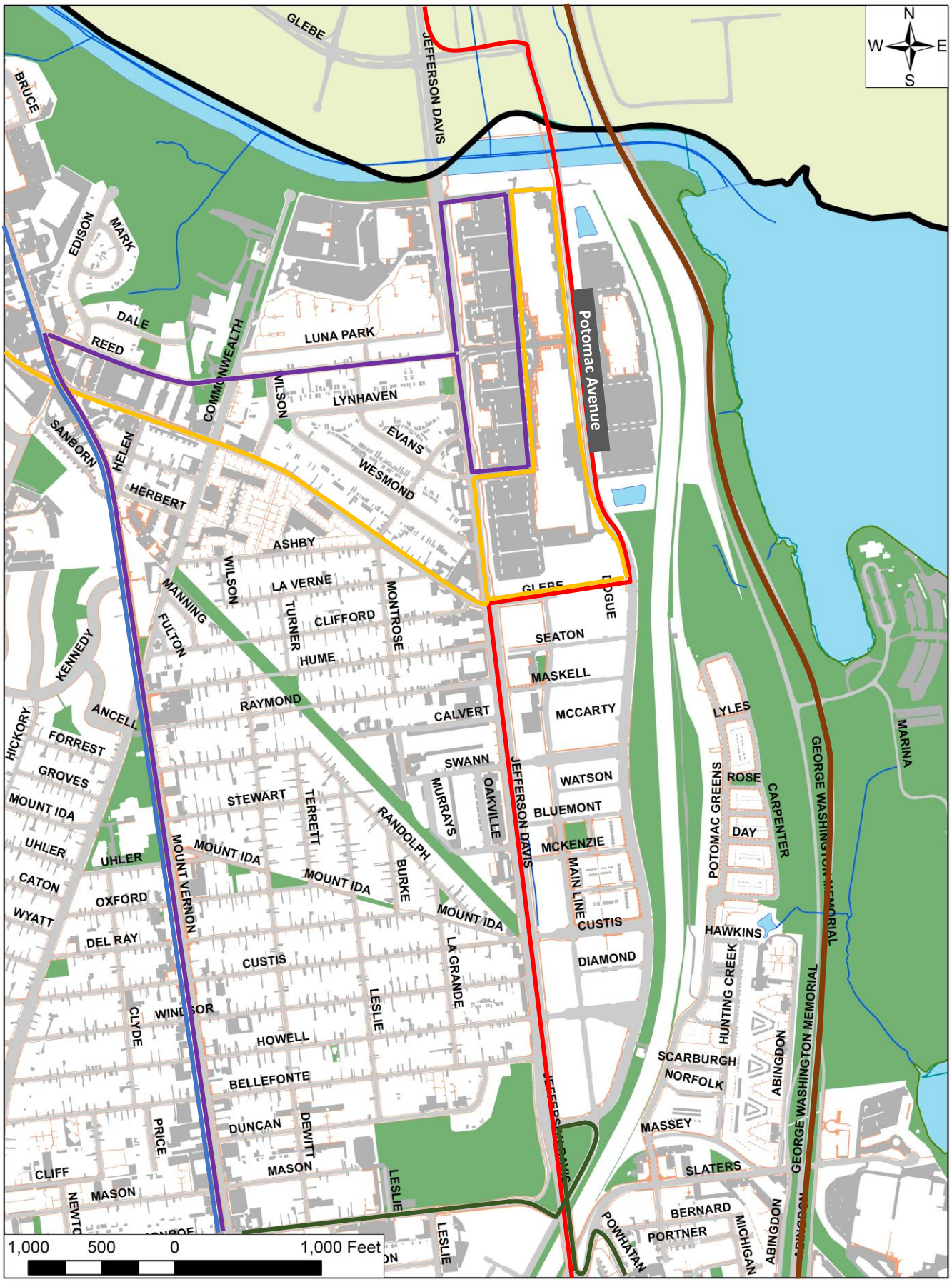
On-street facilities include bike lanes, signed bike routes, and lanes with shared lane markings. Off-street facilities include multi-use trails and other facilities that follow the alignment of streets or trails that are separated from a street. Off-Street bicycle facilities in the study area include the following:

- Path along the east side of US Route 1 from E. Glebe Road to South Four Mile Run Trail.
- Potomac Yard trail along the west side of Potomac Avenue.
- A path along Four-Mile Run from Mt. Vernon Avenue to US Route 1. This trail provides access to the Four-Mile Run trail in Arlington County, which leads to the W&OD trail.
- The Mt. Vernon Trail located east of the study area along the George Washington Memorial Parkway. There is currently no direct access from the study area in Alexandria to the Mt. Vernon Trail. The nearest access is immediately to the north in Arlington County.
- A relatively short off-street trail located in the Mt. Jefferson Park and Greenway in the Del Ray community to the west of the Oakville Triangle and Potomac Yard study area.

On-street facilities (bike lanes and shared lane marking) are located along the following streets:

- Commonwealth Avenue
- Mt. Vernon Avenue
- E. Glebe Road east and west of US Route 1

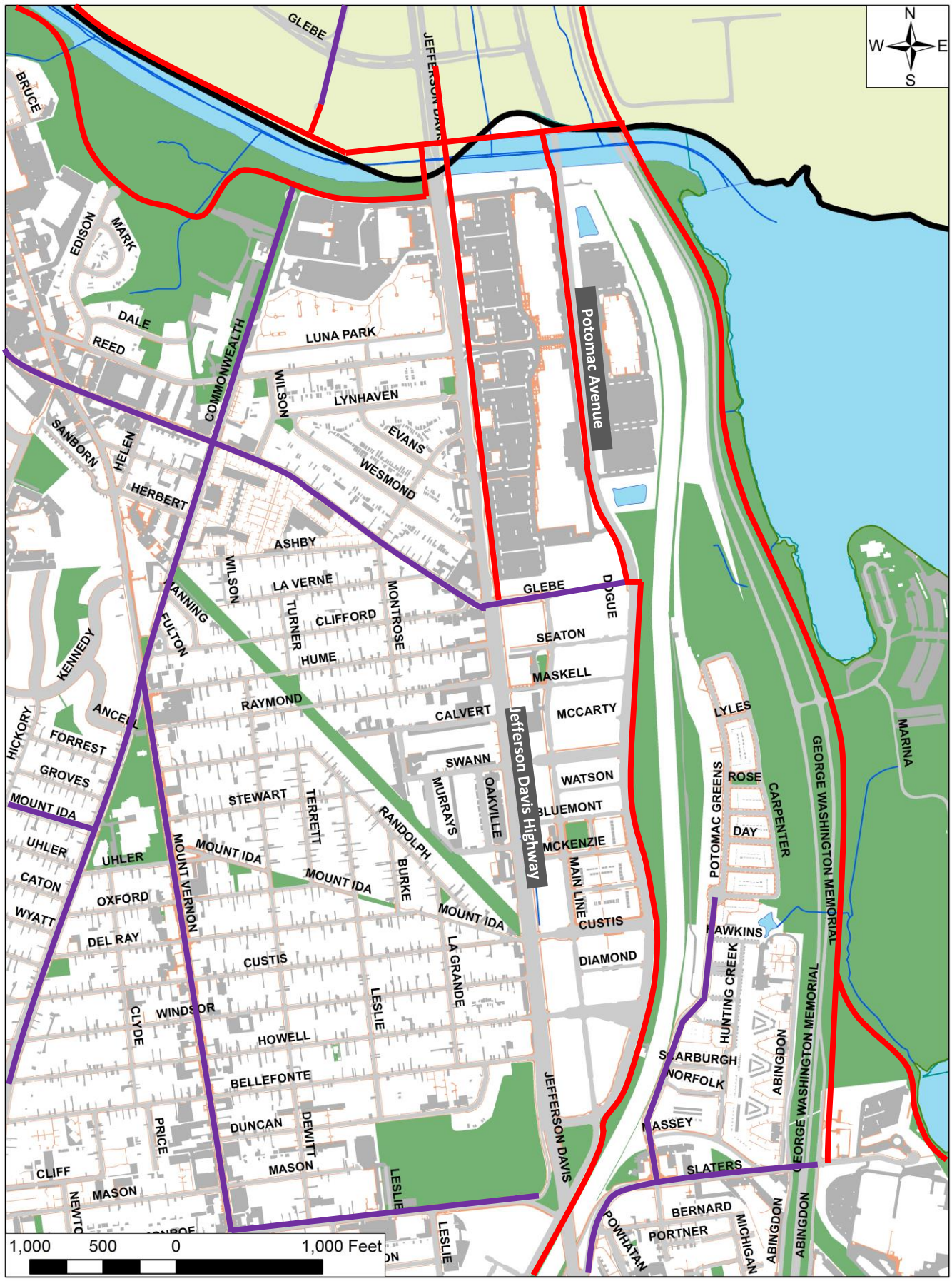
Additionally, in the study area, certain streets are noted as shared roadways through signage. Existing bicycle facilities are shown in **Figure 3-4**.



LEGEND

- MetroWay
- DASH AT 9
- DASH AT 10
- Metrobus 10A and 10B
- Metrobus 10E
- Metrobus 11Y

Figure 3-3: Existing Transit Network



LEGEND

- Off-street Bikeway
- On-Street Bike Route

Figure 3-4: Existing Bicycle Network

Pedestrian Network

Pedestrian facilities in the area include multi-use paths and sidewalks. These facilities are shown on **Figure 3-5**. Sidewalks are generally present along many streets in the study area and most missing gaps in the sidewalk have been completed or will be completed as part of the redevelopment activities to the east and west of US Route 1. **Table 3-1** summarizes the pedestrian amenities found at the study area intersections.

Table 3-1: Study Area Pedestrian Facilities

Study Intersection	Crosswalk	Countdown Signals	ADA Pedestrian Pushbuttons	Ramps with Tactile Surfaces
1. US Route 1 & S. Glebe Road	All legs	All legs	All legs	All corners
2. US Route 1 & Potomac Yard Driveway	All legs	All legs	North and south legs	Northwest and Northeast corners
3. US Route 1 & Luna Park Drive	None	None	None	None
4. US Route 1 & E. Reed Avenue	All legs	All legs	North and south legs	Northwest corner
5. US Route 1 & Montrose Ave.	None	None	None	None
6. US Route 1 & Evans Lane	All legs	All legs	North and south legs	None
7. US Route 1 & E. Glebe Road	All legs	In the median and all legs	In the median and all legs	In the median and all corners except northwest corner
8. US Route 1 & Swann Avenue	All legs	In the median and all legs	In the median and all legs	In the median and all corners
9. US Route 1 & Fannon Street	None	None	None	None
10. US Route 1 & E. Custis Avenue	All legs	In the median and all legs	In the median and all legs	In the median and all corners
11. US Route 1 & E. Howell Avenue	All legs	All legs	All legs	All corners
12. US Route 1 & Potomac Avenue	North and east legs	North and east legs	In median and north and east legs	In the median and all corners
13. US Route 1 and Slaters Lane	South and east legs	South and east legs	In median and south and east legs	In the median and all corners
14. Potomac Avenue & E. Reed Avenue	North and west legs	None	None	Northeast and Southeast corners
15. Potomac Avenue & E. Glebe Road	North, west, and south legs	North, west, and south legs	North, west, and south legs	All corners
16. Potomac Avenue & Swann Avenue	North, west, and south legs	In the median and north, west, and south legs	In the median and north, west, and south legs	In the median and all corners
17. Potomac Avenue & E. Custis Avenue	North, west, and south legs	In the median and north, west, and south legs	In the median and north, west, and south legs	In the median and all corners
18. Potomac Avenue & E. Howell Avenue	North, west, and south legs	In the median and north, west, and south legs	In the median and north, west, and south legs	In the median and all corners
19. Potomac Ave. & Main Line Blvd.	All legs	All Legs	All legs	All corners
20 Commonwealth Ave & E. Glebe Rd	All legs	All legs	All legs	None
21. Commonwealth Ave & Mt. Vernon Ave & Hume Avenue	All legs	All legs except east leg crossing south movement	All legs except east leg crossing south movement	Northwest and northeast corners

Figure 3-5: Existing Pedestrian Network

3.5 EXISTING TRAFFIC VOLUMES

Traffic counts were conducted at study area intersections on weekdays in May and September 2016, between the hours of 6:30 AM and 9:30 AM and between the hours of 4:00 PM and 7:00 PM. These counts were used to establish a network peak hour of traffic activity by identifying the peak 60 minutes of traffic over the entire study area during the AM and PM peak hours. The network peak hours of study were identified as 7:15 AM to 8:15 AM for the morning peak and 4:45 PM to 5:45 PM for the afternoon peak. The weekday peak hour turning movement counts are summarized in **Figure 3-6**. Existing peak hour pedestrian counts at the study area intersections are shown in **Figure 3-7**. Existing peak hour bicycle counts at study area intersections are shown in **Figure 3-8**. The traffic, pedestrian, and bicycle count data are contained in **Appendix B.**

3.6 ANALYSIS METHODOLOGY

This multimodal transportation study has been prepared to conform to the City of Alexandria's Transportation Planning Administrative Guidelines and the Virginia Department of Transportation's (VDOT) *Traffic Impact Analysis Regulations 24 VAC 30-155*. The City's guidelines provide technical procedures to analyze and report the impacts of new development on transportation facilities in the City. Scoping agreements were prepared with the assistance of the City of Alexandria's Department of Transportation and Environmental Services (T&ES) and VDOT. Copies of the signed scoping agreements are included in **Appendix A.**

This study has also been prepared to be generally consistent with previous assumptions that were developed as part of the 2010 Potomac Yard Multimodal Transportation Study as well with previous assumptions that were developed as part of the 2014 Oakville Triangle and Route 1 Planning Area Multimodal Transportation Study.

Per the scoping agreement, the following analyses were conducted in the preparation of this study:

- Microsimulation Analyses using VISSIM 7 for intersections along US Route 1 and Potomac Avenue.
- Intersection Capacity Analyses using Synchro 9.1 for all other study intersections
- Analysis of 2021 (Phase I) and 2040 (full build-out horizon year) conditions

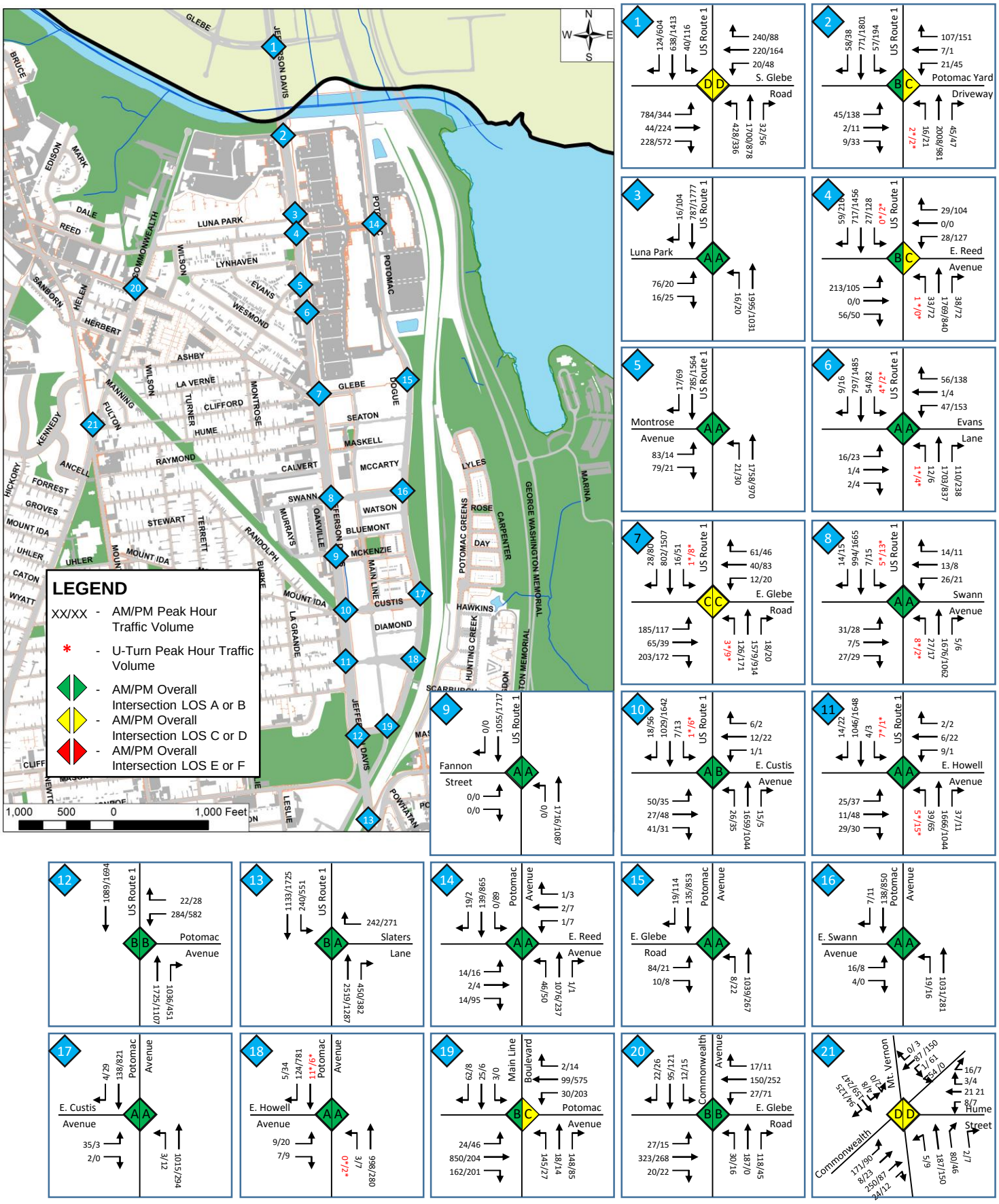


Figure 3-6: Existing Peak Hour Traffic Volumes and LOS

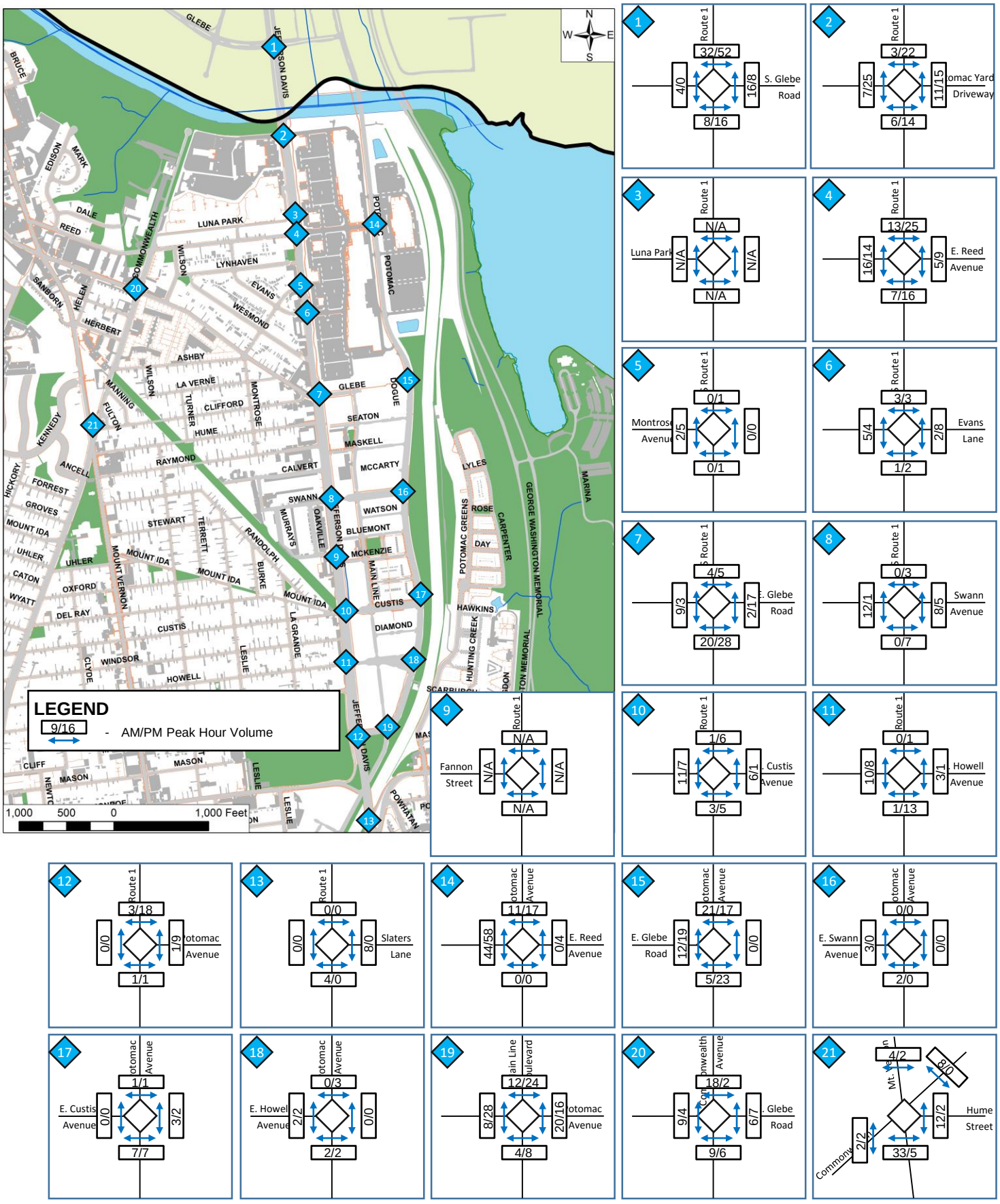


Figure 3-7: Existing Peak Hour Pedestrian Volumes

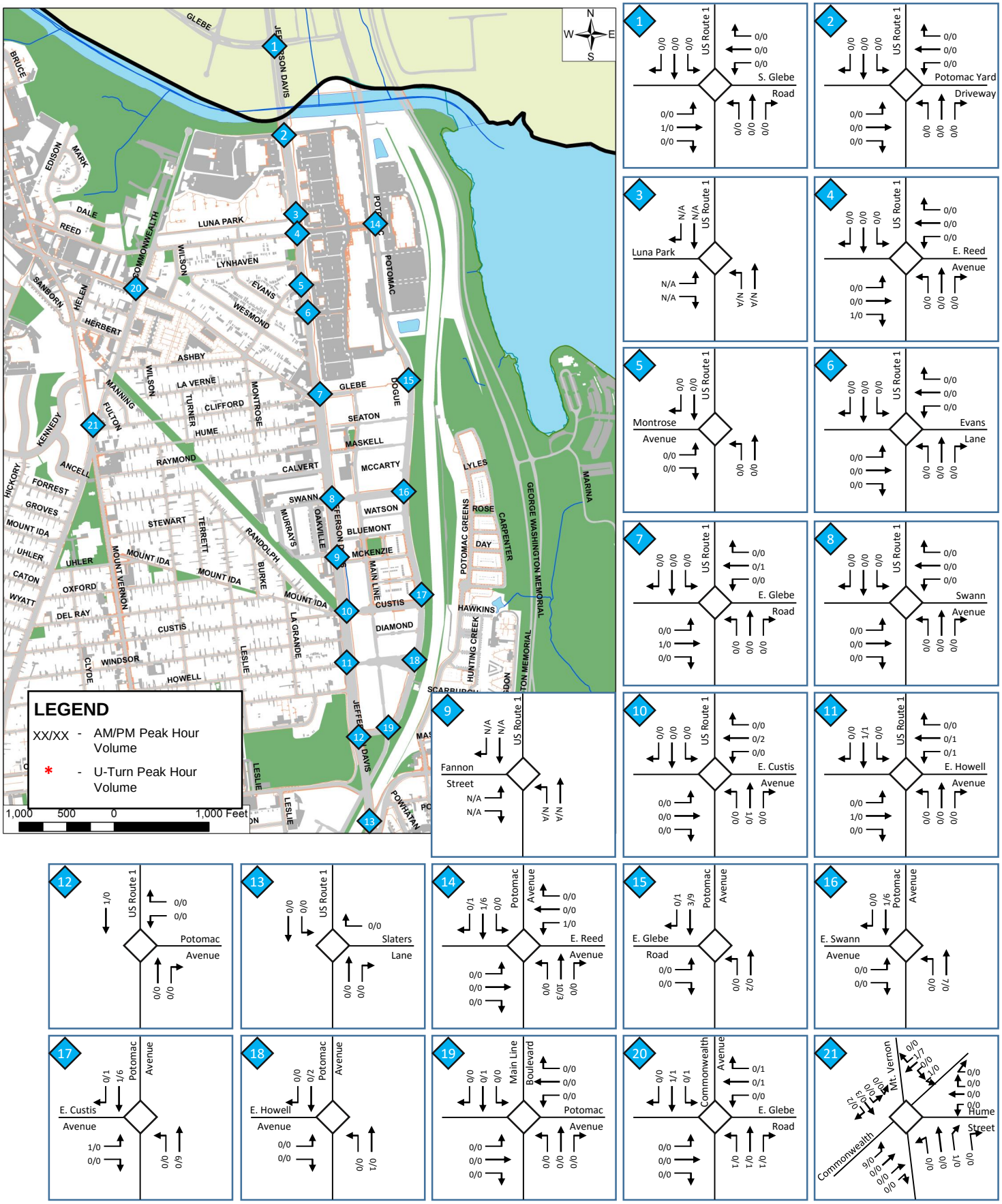


Figure 3-8: Existing Peak Hour Bicycle Volumes

Synchro Methodology

Synchro analyses are based on methodologies contained in the *Highway Capacity Manual, 2010* (HCM) for signalized and unsignalized intersections. Per the HCM, capacity is defined as the maximum number of vehicles that can pass over a particular road segment or through a particular intersection within a fixed time duration. Operational conditions are described by a level of service (LOS), which is a qualitative measure that describes the operational conditions of an intersection or street and is an indicator of motorist perceptions within a traffic stream. The HCM defines six levels of service, LOS A through F, with A as the best and F the worst. **Table 3-2** shows the level of service as a function of the delay experienced per vehicle at signalized and unsignalized intersections. The City of Alexandria does not maintain a minimum LOS standard. In most urban areas, LOS D and, increasingly LOS E are considered acceptable conditions for vehicle operations, particularly along heavily traveled arterial and collector streets and as a balance is achieved between personal vehicles, transit, pedestrians, and bicyclists. It is noted that the use of HCM 2000 methodologies are considered for intersection configurations or operations that cannot be analyzed using 2010 methodologies.

Table 3-2: Level of Service and Ranges of Delay

Level of Service (LOS)	Delay per Vehicle (seconds)	
	Signalized Intersection	Unsignalized Intersection
A	≤ 10	≤ 10
B	> 10 – 20	> 10 – 25
C	> 20 – 35	> 15 – 25
D	> 35 – 55	> 25 – 35
E	> 55 – 80	> 35 – 50
F	> 80 or v/c>1	> 50 or v/c>1
Source: Highway Capacity Manual, 2010 Edition		

VISSIM Methodology

VISSIM is a microscopic analysis tool used to simulate the characteristics and interactions of individual vehicles. It includes algorithms and rules describing how vehicles move and interact within the transportation network, including acceleration, deceleration, and lane changing. VISSIM allows for flexibility to develop a wide range of roadway networks with respect to vehicle movements and roadway geometry and is one of the recommended tools for analyzing oversaturated conditions.

VISSIM reports delay in seconds of delay per vehicle (s/veh) rather than in units of passenger car equivalents like a typical Highway Capacity Manual (HCM) based analysis. Nevertheless, while the VISSIM delays are not exactly equivalent to HCM based delays, intersection level of service (LOS) is reported using the HCM delay-based LOS thresholds identified above. This practice has been accepted on many past projects reviewed by the City and VDOT.

Additional results from VISSIM simulation include travel time along US Route 1 and along Potomac Avenue and vehicle queuing at study area intersections.

Microsimulation results vary depending on the random inputs for each run. A random seed is used to select a sequence of random numbers that are used to influence decisions such as driver aggressiveness, vehicle arrival pattern at entry points, and other factors related to the stochastic nature of traffic simulation models. The results of each run are usually close to the average of all runs; however, each run will be different from the others. Performing too few microsimulation runs does not fully account for microsimulation variance, while using too many runs result in diminishing return with respect to modeling time versus achieving result convergence.

Using the VDOT sample size determination tool, it was determined that 10 runs would provide an acceptable sample for traffic analysis in this corridor.

VISSIM Calibration

Prior to analysis, the VISSIM networks were developed, calibrated, and refined per the City's Transportation Planning Administrative Guidelines and VDOT's Traffic Operations and Safety Analysis Manual (TOSAM). Detailed calibration criteria and results are summarized in **Appendix C**.

Calibrating the VISSIM models to meet the thresholds involved adjusting specific parameters to achieve target conditions. The primary parameters that were adjusted include:

- **Lane-change look-back distance:** Lane-change look-back distance is the distance in VISSIM where a vehicle starts attempting to make a lane change to a target lane prior to an off-ramp, a lane drop, or change in direction in travel. This lane-change look-back distance is a parameter on every connector in the VISSIM network - the default change distance is 656 feet. This distance is typically acceptable for low-speed, intersection turning movements; however, it would produce challenging and unrealistic lane changing behavior at higher-speed lane drops. This parameter was adjusted (to 700 ft and 800 feet) for the connectors between the northbound links between Slaters Lane and Potomac Avenue. These lane-change look-back distances were modified to remove unrealistic lane-changing behavior creating artificial congestion as a first step of the calibration process.
- **Conflict area and priority rules:** VISSIM provides two types of network parameters to create conditions where vehicles traveling on one link must yield to vehicles traveling on another link: conflict areas and priority rules. Both of these parameters allow for the replication of upstream and downstream headways and speeds that vehicles are willing to accept for turning movements, such as right turns on red or permissive left turns from a traffic signal or stop sign. Conflict areas were coded at all locations where two links or connectors overlapped in the network with the appropriate parameters for front gap(s), rear gap(s), and safety distance factor.
- **Desired Speed Distributions (DSD):** DSDs were set-up to be consistent with TOSAM recommendations. One key difference however is that the 35 mph DSD is not a linear distribution; the distribution was modified to result in 35 mph as the 85th percentile speed. Separate DSDs were also prepared for left turns, U-turns, right-turns, and high-speed right turns. The high-speed right turn DSD was used for the northbound right turn movement from

US Route 1 to Potomac Avenue to allow vehicles to take the curve at higher speeds as seemingly allowed by the curve's geometry.

- **Driving Behavior**: Urban aggressive link behavior was coded along US Route 1 on the northbound approach between Slaters Lane and Potomac Avenue. This behavior allows for vehicles to accept smaller gaps and be more aggressive in lane changes.

An overall summary of the calibration of the existing conditions AM and PM VISSIM models is provided in **Figure 3-9**.

In addition to calibration, assumptions were made regarding the lane use at unmarked approaches to intersections. These assumptions were based either on previous studies or observed vehicle operation. Specifically, the eastbound approach of Luna Park Drive is unmarked and was analyzed based on observed vehicle operation.

During the AM, volume and travel time calibration criteria were met. It is noted that simulated speeds, while not meeting criteria thresholds, closely replicate the Regional Integrated Transportation Information System (RITIS) probe speeds, as provided by INRIX, a transportation analytics company. RITIS average speed data was aggregated over a longer sample period and concluded to be more representative of existing conditions. During the PM, volume, travel time, and speed calibration criteria were met.

Queue length criteria were not met for AM and PM. The field observed queue data was collected as a spot check and observations were likely not long enough to capture the maximum queue estimated by VISSIM. Nevertheless, the City of Alexandria confirmed that the models were reasonably calibrated to represent existing conditions.

AM CALIBRATION

Calibration Item	Basis	Criteria	Subtotal	Total	Percent	Target	Target Met
Simulated Approach Volume	Approaches (n = 61)	Within ± 20% for <100 vph	15	57	93%	85%	Yes
		Within ± 15% for ≥ 100 vph to < 300 vph	9				
		Within ± 10% for ≥ 300 vph to < 1,000 vph	10				
		Within ± 5% for ≥ 1,000 vph	23				
Simulated Travel Time	Corridor (n=2)	Within ± 30% for average observed travel time of entire corridor		2	100%	85%	Yes
Simulated Speed	Corridor (n=2)	Within ± 5 mph for select number of critical routes		1	50%	85%	No
Simulated Queue Length	Approaches (n = 11)	Within ± 20% of observed maximum queue lengths		7	64%	85%	No
		Within ± 20% of observed maximum queue lengths or greater than observed maximum queue		9	82%	85%	No

PM CALIBRATION

Calibration Item	Basis	Criteria	Subtotal	Total	Percent	Target	Target Met
Simulated Approach Volume	Approaches (n = 61)	Within ± 20% for <100 vph	11	59	97%	85%	Yes
		Within ± 15% for ≥ 100 vph to < 300 vph	16				
		Within ± 10% for ≥ 300 vph to < 1,000 vph	12				
		Within ± 5% for ≥ 1,000 vph	20				
Simulated Travel Time	Corridor (n=2)	Within ± 30% for average observed travel time of entire corridor		2	100%	85%	Yes
Simulated Speed	Corridor (n=2)	Within ± 5 mph for select number of critical routes		2	100%	85%	Yes
Simulated Queue Length	Approaches (n = 11)	Within ± 20% of observed maximum queue lengths		6	55%	85%	No
		Within ± 20% of observed maximum queue lengths or greater than observed maximum queue		9	82%	85%	No

Figure 3-9: AM and PM Calibration Summary Results

3.7 EXISTING CONDITIONS TRAFFIC ANALYSIS

Level of Service and Delay

Analysis of existing conditions was based on the existing peak hour turning movement volumes, lane uses, heavy vehicle percentages, and traffic control and signal timing at the study intersections. Results of the intersection capacity analyses are summarized in **Figure 3-6** and **Table 3-3.** Synchro output reports are included in **Appendix D**. VISSIM output tables are included in **Appendix E.**

The analysis shows that all study intersections operate at an overall LOS D or better during both the AM and PM peak hours. The existing local street network to the west, north, and south of Route 1, the developing grid network of streets in South Potomac Yard, and the availability of Potomac Avenue as a viable north-south alternative provide convenient opportunities for vehicle, pedestrian, bicycle, and transit travel. The interconnected network of streets allows for the efficient dispersion of traffic, reducing the automobile pressure along the US Route 1 corridor and allowing the signalized and unsignalized intersections in the area to operate at acceptable levels of service.

It should be noted that there are side street approaches and movements that operate at LOS E or F. Some key intersections with high side street approach delays are noted below.

- Eastbound S. Glebe Road at US Route 1 operates at LOS E during the AM and PM peak hours.
- Northbound Potomac Yard Driveway at US Route 1 operates at LOS E during the AM and PM peak hours. Potomac Yard Driveway is the street opposite the Toyota Dealership.
- Westbound Potomac Yard Driveway at US Route 1 operates at LOS E during the AM and PM peak hours. Potomac Yard Driveway is the street opposite the Toyota Dealership.
- Eastbound Evans Lane at US Route 1 operates at LOS E during the AM peak hour.
- Eastbound E. Glebe Road at US Route 1 operates at LOS F during the AM peak hour and LOS E during the PM peak hour.

US Route 1 is an essential component of north-south movements in the City of Alexandria and the greater Northern Virginia region. In order to ensure its continued success as an alternate route to the I-95 corridor, as a connection between Fairfax County, Alexandria, and Arlington County, and as a transit-oriented corridor offering traditional (DASH and Metrobus) and enhanced (Metroway) transit options, the City has prioritized the efficient operations of the north-south through movements. This approach is common in urban corridors and it is a generally accepted tradeoff that this prioritization may result in increased side street approach and turning movement delays.

Table 3-3: Existing Traffic Analysis LOS (sec/veh)						
Intersection	Approach	Mvmt	Existing Conditions			
			AM		PM	
US Route 1 and S. Glebe Road	NB	LT	64.3 (E)	48.3 (D)	46.7 (D)	31.1 (C)
		TH	44.9 (D)		26.5 (C)	
		RT	14.2 (B)		7 (A)	
	SB	LT	71.3 (E)	33.4 (C)	77.9 (E)	36.5 (D)
		TH	36.6 (D)		40.1 (D)	
		RT	4.9 (A)		19.8 (B)	
	EB	LT	76.8 (E)	62.7 (E)	53 (D)	69.8 (E)
		TH	73.9 (E)		62.7 (E)	
		RT	11.5 (B)		82.8 (F)	
	WB	LT	69.4 (E)	44.3 (D)	64.5 (E)	50.9 (D)
		TH	68.4 (E)		70.6 (E)	
		RT	21.7 (C)		5.6 (A)	
	Intersection		**49.3 (D)**		**43.9 (D)**	
US Route 1 and Potomac Yard Driveway opposite Alexandria Toyota	NB	U-Turn	72.5 (E)	72.5 (E)	65.6 (E)	65.6 (E)
		LT	83.1 (F)		73.9 (E)	
		TH	7.9 (A)		15.8 (B)	
		RT	5.6 (A)		8.8 (A)	
	SB	LT	64.2 (E)	11.6 (B)	54.3 (D)	34.3 (C)
		TH	7.7 (A)		32.2 (C)	
		RT	8.5 (A)		34.1 (C)	
	EB	LT	57 (E)	51.9 (D)	55.3 (E)	53.4 (D)
		TH	56.1 (E)		51.5 (D)	
		RT	25.5 (C)		45.5 (D)	
	WB	LT	61.2 (E)	61.1 (E)	59.8 (E)	56.3 (E)
		TH	46.8 (D)		0 (A)	
		RT	61.8 (E)		55.3 (E)	
	Intersection		**12.5 (B)**		**31.1 (C)**	
US Route 1 and Luna Park Drive	NB	LT	5.8 (A)	1.9 (A)	18 (B)	1 (A)
		TH	1.9 (A)		0.7 (A)	
	SB	TH	2 (A)	2 (A)	6.3 (A)	6.3 (A)
		RT	1.2 (A)		6.2 (A)	
	EB	LT	63 (E)	53.1 (D)	62.6 (E)	35.5 (D)
		RT	5.9 (A)		13.9 (B)	
	Intersection		**3.5 (A)**		**4.8 (A)**	

Table 3-3: Existing Traffic Analysis LOS (sec/veh) Continued						
Intersection	Approach	Mvmt	Existing Conditions			
			AM		PM	
US Route 1 and E. Reed Avenue	NB	U-Turn	22.9 (C)	15.5 (B)	0 (A)	11.4 (B)
		LT	20 (B)		36.6 (D)	
		TH	15.6 (B)		9.9 (A)	
		RT	6.2 (A)		2.5 (A)	
	SB	U-Turn	0 (A)	17.3 (B)	32.9 (C)	21.1 (C)
		LT	31.2 (C)		29.1 (C)	
		TH	16.7 (B)		20.3 (C)	
		RT	18.3 (B)		21.4 (C)	
	EB	LT	64.7 (E)	54.7 (D)	57.7 (E)	42.3 (D)
		TH	-		-	
		RT	17.7 (B)		12.4 (B)	
	WB	LT	60.2 (E)	36.2 (D)	58.1 (E)	34.7 (C)
		TH	-		-	
		RT	14.6 (B)		4.9 (A)	
	Intersection		**19.9 (B)**		**20.1 (C)**	
US Route 1 and Montrose Avenue	NB	LT	5.4 (A)	2.9 (A)	17.6 (B)	0.8 (A)
		TH	2.9 (A)		0.3 (A)	
	SB	TH	1 (A)	1 (A)	1.1 (A)	1.1 (A)
		RT	1.5 (A)		1.9 (A)	
	EB	LT	30 (C)	21 (C)	24.1 (C)	13.4 (B)
		RT	12 (B)		5.7 (A)	
	Intersection		**3.4 (A)**		**1.2 (A)**	
US Route 1 and Evans Lane	NB	U-Turn	1.3 (A)	3.1 (A)	2.4 (A)	3.5 (A)
		LT	2.1 (A)		6.1 (A)	
		TH	3.2 (A)		3.3 (A)	
		RT	2.3 (A)		4.1 (A)	
	SB	U-Turn	1.9 (A)	1.2 (A)	0.6 (A)	2.3 (A)
		LT	1.1 (A)		2.2 (A)	
		TH	1.2 (A)		2.3 (A)	
		RT	1.3 (A)		1.8 (A)	
	EB	LT	62.4 (E)	55.6 (E)	53 (D)	47.8 (D)
		TH	67.8 (E)		53 (D)	
		RT	15.2 (B)		11.2 (B)	
	WB	LT	60 (E)	34.7 (C)	62 (E)	37 (D)
		TH	61.8 (E)		57.8 (E)	
		RT	16.3 (B)		11.7 (B)	
	Intersection		**4 (A)**		**6.5 (A)**	

Table 3-3: Existing Traffic Analysis LOS (sec/veh) Continued						
Intersection	Approach	Mvmt	Existing Conditions			
			AM		PM	
US Route 1 and E. Glebe Road	NB	U-Turn	88.7 (F)	12.9 (B)	50.4 (D)	21.3 (C)
		LT	81 (F)		60.2 (E)	
		TH	7.4 (A)		13.9 (B)	
		RT	7 (A)		17.6 (B)	
	SB	U-Turn	68.9 (E)	24.7 (C)	86.7 (F)	23.7 (C)
		LT	71.8 (E)		81.1 (F)	
		TH	23.7 (C)		21.6 (C)	
		RT	22.9 (C)		20.9 (C)	
	EB	LT	110 (F)	93.2 (F)	96.6 (F)	69.5 (E)
		TH	110.6 (F)		87.5 (F)	
		RT	72.7 (E)		47.4 (D)	
	WB	LT	66.6 (E)	38.6 (D)	75.1 (E)	51.7 (D)
		TH	61.1 (E)		65.3 (E)	
		RT	19.9 (B)		16.9 (B)	
	Intersection		**28.3 (C)**		**28.9 (C)**	
US Route 1 and Swann Avenue	NB	U-Turn	76.8 (E)	4.5 (A)	83.6 (F)	9.3 (A)
		LT	80.6 (F)		73.8 (E)	
		TH	2.9 (A)		8.1 (A)	
		RT	3.9 (A)		10.2 (B)	
	SB	U-Turn	62.1 (E)	11.6 (B)	84.3 (F)	4.4 (A)
		LT	60.2 (E)		83.5 (F)	
		TH	10.8 (B)		3 (A)	
		RT	22.1 (C)		3.4 (A)	
	EB	LT	53.4 (D)	35.3 (D)	69.9 (E)	54.2 (D)
		TH	49.9 (D)		59.4 (E)	
		RT	11.3 (B)		37.5 (D)	
	WB	LT	53.1 (D)	43.2 (D)	64.7 (E)	54 (D)
		TH	44.1 (D)		66.1 (E)	
		RT	21 (C)		19.9 (B)	
	Intersection		**8.5 (A)**		**8.1 (A)**	

Table 3-3: Existing Traffic Analysis LOS (sec/veh) Continued						
Intersection	Approach	Mvmt	Existing Conditions			
			AM		PM	
US Route 1 and E. Custis Avenue	NB	U-Turn	0 (A)	3.3 (A)	0 (A)	8.3 (A)
		LT	81.2 (F)		72.3 (E)	
		TH	2 (A)		6 (A)	
		RT	2.2 (A)		7.7 (A)	
	SB	U-Turn	41.7 (D)	14.4 (B)	90.9 (F)	9.6 (A)
		LT	83.8 (F)		91.1 (F)	
		TH	13.8 (B)		8.5 (A)	
		RT	17.6 (B)		11.3 (B)	
	EB	LT	52.5 (D)	46 (D)	52.5 (D)	47 (D)
		TH	53.6 (D)		52.5 (D)	
		RT	32 (C)		32.8 (C)	
	WB	LT	39.6 (D)	33 (C)	64.4 (E)	46.7 (D)
		TH	42.9 (D)		49.3 (D)	
		RT	10.5 (B)		9.4 (A)	
	Intersection		**9.3 (A)**		**10.9 (B)**	
US Route 1 and E. Howell Avenue	NB	U-Turn	65.2 (E)	5.6 (A)	55.6 (E)	8.8 (A)
		LT	74.4 (E)		60.6 (E)	
		TH	3.8 (A)		4.7 (A)	
		RT	3.7 (A)		3.2 (A)	
	SB	U-Turn	58.2 (E)	5.4 (A)	71 (E)	6.2 (A)
		LT	73.8 (E)		69.8 (E)	
		TH	4.7 (A)		6 (A)	
		RT	3.3 (A)		4.3 (A)	
	EB	LT	56 (E)	42 (D)	61.3 (E)	54.4 (D)
		TH	54.6 (D)		60.9 (E)	
		RT	24.2 (C)		35.1 (D)	
	WB	LT	66.1 (E)	57.9 (E)	66.1 (E)	53.7 (D)
		TH	53.3 (D)		56.9 (E)	
		RT	12 (B)		13.4 (B)	
	Intersection		**6.7 (A)**		**9.5 (A)**	
US Route 1 and Potomac Avenue	NB	TH	4.9 (A)	8.7 (A)	8.2 (A)	6.6 (A)
		RT	14.9 (B)		2.6 (A)	
	SB	TH	4.7 (A)	4.7 (A)	5.6 (A)	5.6 (A)
	WB	LT	57.5 (E)	54.6 (D)	45.9 (D)	44.5 (D)
		RT	13.7 (B)		18.1 (B)	
	Intersection		**10.8 (B)**		**12.1 (B)**	

Table 3-3: Existing Traffic Analysis LOS (sec/veh) Continued						
Intersection	Approach	Mvmt	Existing Conditions			
			AM		PM	
US Route 1 and Slaters Lane	NB	TH	21.5 (C)	21.8 (C)	3.2 (A)	6.3 (A)
		RT	23.3 (C)		16.8 (B)	
	SB	LT	43.5 (D)	12.3 (B)	3.8 (A)	3.2 (A)
		TH	5.8 (A)		3 (A)	
	WB	RT	20 (B)	20 (B)	4 (A)	4 (A)
	Intersection		**18.8 (B)**		**4.5 (A)**	
Potomac Avenue and E. Reed Avenue	NB	LT	5.8 (A)	5.7 (A)	4.5 (A)	1.4 (A)
		TH	5.7 (A)		0.8 (A)	
		RT	7.7 (A)		1.7 (A)	
	SB	LT	0.9 (A)	0.3 (A)	1.4 (A)	1 (A)
		TH	0.2 (A)		1 (A)	
		RT	0.5 (A)		1 (A)	
	EB	LT	11.6 (B)	9 (A)	10.6 (B)	10.3 (B)
		TH	11.3 (B)		14.7 (B)	
		RT	6.5 (A)		10 (A)	
	WB	LT	12 (B)	20.2 (C)	8.5 (A)	12.9 (B)
		TH	9.8 (A)		11.8 (B)	
		RT	22.8 (C)		15.8 (B)	
	Intersection		**5.4 (A)**		**2.1 (A)**	
Potomac Avenue and E. Glebe Road	NB	LT	4.6 (A)	4.6 (A)	6.9 (A)	2.5 (A)
		TH	4.6 (A)		2.1 (A)	
	SB	TH	2.5 (A)	2.5 (A)	4 (A)	4 (A)
		RT	2.4 (A)		4.3 (A)	
	EB	LT	52.1 (D)	48.6 (D)	54.6 (D)	45.1 (D)
		RT	17.1 (B)		15.3 (B)	
	Intersection		**7.8 (A)**		**4.7 (A)**	
Potomac Avenue and Swann Avenue	NB	LT	7.6 (A)	6.6 (A)	5.4 (A)	0.8 (A)
		TH	6.6 (A)		0.6 (A)	
	SB	TH	3.3 (A)	3.3 (A)	1 (A)	1 (A)
		RT	2.9 (A)		1.7 (A)	
	EB	LT	31.4 (C)	32.7 (C)	44 (D)	44 (D)
		RT	38.1 (D)		0 (A)	
	Intersection		**6.7 (A)**		**1.3 (A)**	

Table 3-3: Existing Traffic Analysis LOS (sec/veh)						
Intersection	Approach	Mvmt	Existing Conditions			
			AM		PM	
Potomac Avenue and E. Custis Avenue	NB	U-Turn	0 (A)	7.2 (A)	0 (A)	2.3 (A)
		LT	7.9 (A)		8.7 (A)	
		TH	7.2 (A)		2.1 (A)	
	SB	TH	5.1 (A)	5 (A)	3 (A)	3 (A)
		RT	3.2 (A)		3.3 (A)	
	EB	LT	52.3 (D)	50.6 (D)	100.5 (F)	100.5 (F)
		RT	20.6 (C)		0 (A)	
	Intersection		**8.4 (A)**		**3.2 (A)**	
Potomac Avenue and E. Howell Avenue	NB	U-Turn	0 (A)	2.3 (A)	14.8 (B)	2.3 (A)
		LT	4.3 (A)		6 (A)	
		TH	2.3 (A)		2.1 (A)	
	SB	U-Turn	11.2 (B)	2.1 (A)	3.5 (A)	1.3 (A)
		TH	1.3 (A)		1.3 (A)	
		RT	1.2 (A)		1.3 (A)	
	EB	LT	52.8 (D)	46.4 (D)	48.8 (D)	47.6 (D)
		RT	39.2 (D)		45.5 (D)	
	Intersection		**2.9 (A)**		**2.7 (A)**	
Potomac Avenue and Main Line Boulevard	NB	LT	34.7 (C)	32.6 (C)	50.2 (D)	44.6 (D)
		TH	28.3 (C)		38.4 (D)	
		RT	31.1 (C)		44 (D)	
	SB	LT	29.5 (C)	27.8 (C)	0 (A)	40 (D)
		TH	26.5 (C)		39.4 (D)	
		RT	28.3 (C)		40.5 (D)	
	EB	LT	8.1 (A)	7.3 (A)	16.9 (B)	9.3 (A)
		TH	7.6 (A)		10.4 (B)	
		RT	5.3 (A)		6.4 (A)	
	WB	LT	40.2 (D)	14.2 (B)	52.8 (D)	24.6 (C)
		TH	6.4 (A)		14.5 (B)	
		RT	1.7 (A)		2.9 (A)	
	Intersection		**14 (B)**		**21.6 (C)**	

Table 3-3: Existing Traffic Analysis LOS (sec/veh)							
Intersection	Approach	Mvmt	Existing Conditions				
			AM		PM		
Commonwealth Avenue & West Glebe Road/East Glebe Road*	EB	LTR	B (17.4)		B (14.7)		
	WB	LTR	B (11.9)		B (16.6)		
	NB	LTR	B (14.0)		B (14.5)		
	SB	LTR	B (14.9)		B (15.8)		
	Intersection		**B (17.6)**		**B (15.1)**		
Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue*	WB	LR	D (51.7)		D (49.1)		
	NB	TL	C (31.5)	C (29.7)	C (26.8)	C (25.7)	
		R	C (25.4)		C (22.4)		
	SB	TL	D (31.9)	C (23.0)	D (35.5)	C (27.3)	
		R	A (7.6)		B (10.3)		
	NEB	L	D (37.5)	D (46.7)	D (41.5)	D (43.9)	
		TR	D (52.3)		D (45.6)		
	SWB	LTR	D (52.9)		D (50.6)		
	Intersection		**D (38.5)**		**D (35.8)**		

*Analyzed in Synchro

Queuing

The VISSIM reported average and maximum queues are shown in **Table 3-4**.

Along US Route 1, average queues are generally contained within block lengths and storage lengths at intersections. Locations of significant maximum queuing include the eastbound approach of the intersection of US Route 1 and E. Glebe Road, the westbound approach of the intersection of US Route 1 and Potomac Avenue, the southbound and eastbound approaches of the intersection of US Route 1 and E. Reed Avenue, and the northbound approach of the intersection of US Route 1 and Slaters Lane. Vehicle queues at these key intersections have the potential to spill back to upstream intersections and negatively impact traffic operations.

Along Potomac Avenue, vehicle queuing is generally not an issue. Average and maximum approach and turn lane queues are generally contained within block lengths and storage lengths at intersections.

Table 3-4: Existing Traffic Analysis Average (Max) Queuing (feet)					
Intersection	**Approach**	**Mvmt**	**Block or Storage Length**	**AM**	**PM**
US Route 1 and S. Glebe Road	NB	LT	535	92 (314)	57 (236)
		TH	830	140 (760)	58 (318)
		RT	360	155 (787)	72 (345)
	SB	LT	310	18 (126)	54 (236)
		TH	895	60 (240)	136 (613)
		RT	320	5 (117)	54 (438)
	EB	LT	500	193 (592)	132 (660)
		TH	500	193 (592)	132 (660)
		RT		15 (159)	365 (808)
	WB	LT	175	8 (66)	17 (113)
		TH	555	59 (196)	42 (153)
		RT	160	0 (13)	0 (0)
US Route 1 and Potomac Yard Driveway opposite Alexandria Toyota	NB	U-Turn	240	10 (71)	11 (77)
		LT		10 (71)	11 (77)
		TH	445	33 (499)	46 (274)
		RT		39 (525)	56 (300)
	SB	LT	250	24 (160)	46 (323)
		TH	830	15 (271)	145 (661)
		RT		21 (301)	159 (691)
	EB	LT	375	16 (121)	62 (298)
		TH		16 (121)	62 (298)
		RT		29 (150)	83 (326)
	WB	LT	275	10 (86)	17 (118)
		TH		10 (86)	17 (118)
		RT	350	46 (230)	54 (247)
US Route 1 and Luna Park Drive	NB	LT	95	0 (58)	2 (55)
		TH	395	6 (242)	1 (78)
	SB	TH	465	4 (136)	22 (403)
		RT		7 (169)	24 (442)
	EB	LT	150	28 (144)	7 (68)
		RT		0 (41)	2 (46)

Table 3-4: Existing Traffic Analysis Average (Max) Queuing (feet)					
Intersection	**Approach**	**Mvmt**	**Block or Storage Length**	**AM**	**PM**
US Route 1 and E. Reed Avenue	NB	U-Turn	95	1 (37)	8 (191)
		LT		1 (37)	8 (191)
		TH	450	117 (585)	29 (316)
		RT	155	0 (23)	0 (42)
	SB	U-Turn	300	2 (58)	13 (155)
		LT		2 (58)	13 (155)
		TH	405	48 (407)	124 (505)
		RT		48 (407)	124 (505)
	EB	LT	575	96 (431)	40 (232)
		TH		- (-)	- (-)
		RT	180	95 (430)	39 (231)
	WB	LT	180	4 (75)	25 (128)
		TH	100	- (-)	- (-)
		RT		2 (62)	2 (75)
US Route 1 and Montrose Avenue	NB	LT	75	0 (34)	2 (58)
		TH	225	7 (286)	0 (69)
	SB	TH	445	1 (161)	2 (241)
		RT		1 (158)	3 (245)
	EB	LT	300	20 (169)	3 (60)
		RT		5 (115)	0 (3)
US Route 1 and Evans Lane	NB	U-Turn	150	0 (13)	0 (16)
		LT		0 (13)	0 (16)
		TH	770	7 (315)	4 (133)
		RT	160	0 (0)	0 (0)
	SB	U-Turn	160	0 (38)	1 (51)
		LT		0 (38)	1 (51)
		TH	150	3 (114)	9 (200)
		RT	225	0 (21)	1 (110)
	EB	LT	25	7 (71)	9 (98)
		TH		7 (71)	9 (98)
		RT		14 (99)	17 (125)
	WB	LT	290	16 (111)	56 (198)
		TH	130	1 (72)	5 (135)
		RT		7 (105)	13 (168)

Table 3-4: Existing Traffic Analysis Average (Max) Queuing (feet)					
Intersection	**Approach**	**Mvmt**	**Block or Storage Length**	**AM**	**PM**
US Route 1 and E. Glebe Road	NB	U-Turn	350	68 (255)	77 (324)
		LT	350	68 (255)	77 (324)
		TH	1025	42 (328)	54 (347)
		RT		42 (328)	54 (347)
	SB	U-Turn	250	8 (71)	27 (145)
		LT		8 (71)	27 (145)
		TH	765	69 (460)	118 (824)
		RT		69 (462)	120 (827)
	EB	LT	70	257 (891)	109 (500)
		TH		257 (891)	109 (500)
		RT		257 (891)	111 (502)
	WB	LT	265	22 (177)	42 (249)
		TH		22 (177)	42 (249)
		RT	185	19 (178)	40 (250)
US Route 1 and Swann Avenue	NB	U-Turn	185	17 (93)	8 (68)
		LT		17 (93)	8 (68)
		TH	1100	14 (312)	30 (418)
		RT		12 (313)	30 (419)
	SB	U-Turn	200	6 (60)	14 (82)
		LT		6 (60)	14 (82)
		TH	1020	42 (356)	16 (366)
		RT		41 (354)	15 (364)
	EB	LT	150	13 (114)	16 (93)
		TH		13 (114)	16 (93)
		RT		18 (125)	22 (104)
	WB	LT	180	13 (108)	12 (99)
		TH		13 (108)	12 (99)
		RT		13 (109)	13 (100)

Table 3-4: Existing Traffic Analysis Average (Max) Queuing (feet)					
Intersection	**Approach**	**Mvmt**	**Block /Storage Length**	**AM**	**PM**
US Route 1 and E. Custis Avenue	NB	U-Turn	155	13 (90)	16 (116)
		LT		13 (90)	16 (116)
		TH	440	11 (269)	21 (334)
		RT		12 (277)	23 (342)
	SB	U-Turn	155	3 (50)	11 (93)
		LT		3 (50)	11 (93)
		TH	1100	50 (498)	48 (561)
		RT		53 (508)	50 (571)
	EB	LT	500	33 (195)	32 (181)
		TH		33 (195)	32 (181)
		RT		30 (198)	30 (184)
	WB	LT	180	4 (49)	6 (67)
		TH		4 (49)	6 (67)
		RT		1 (48)	3 (67)
US Route 1 and E. Howell Avenue	NB	U-Turn	160	20 (121)	32 (239)
		LT		20 (121)	32 (239)
		TH	630	22 (276)	18 (278)
		RT		23 (284)	19 (285)
	SB	U-Turn	150	5 (57)	2 (42)
		LT		5 (57)	2 (42)
		TH	445	19 (276)	28 (511)
		RT		19 (288)	29 (523)
	EB	LT	500	16 (123)	38 (195)
		TH		16 (123)	38 (195)
		RT		16 (125)	40 (197)
	WB	LT	180	5 (57)	7 (67)
		TH		5 (57)	7 (67)
		RT		7 (67)	10 (76)
US Route 1 and Potomac Avenue	NB	TH	930	23 (693)	32 (378)
		RT	930	24 (628)	1 (184)
	SB	TH	635	16 (263)	34 (525)
	WB	LT	190	59 (218)	116 (353)
		RT	190	64 (232)	124 (367)
US Route 1 and Slaters Lane	NB	TH	690	153 (1098)	7 (223)
		RT	180	59 (834)	22 (308)
	SB	LT	930	58 (368)	0 (36)
		TH	930	17 (408)	3 (180)
	WB	RT	275	23 (225)	1 (108)

Table 3-4: Existing Traffic Analysis Average (Max) Queuing (feet)					
Intersection	**Approach**	**Mvmt**	**Block or Storage Length**	**AM**	**PM**
Potomac Avenue and E. Reed Avenue	NB	LT	245	2 (211)	1 (60)
		TH		1 (108)	0 (0)
		RT		1 (108)	0 (0)
	SB	LT	235	0 (0)	0 (0)
		TH		0 (4)	0 (78)
		RT		0 (0)	0 (80)
	EB	LT	215	1 (60)	6 (99)
		TH		1 (60)	6 (99)
		RT		1 (60)	6 (99)
	WB	LT	215	1 (66)	1 (65)
		TH		1 (67)	2 (66)
		RT		2 (65)	1 (64)
Potomac Avenue and E. Glebe Road	NB	LT	145	0 (14)	0 (42)
		TH	260	15 (303)	2 (70)
	SB	TH	385	1 (70)	9 (191)
		RT		4 (127)	17 (248)
	EB	LT	500	26 (174)	8 (83)
		RT		34 (190)	11 (99)
Potomac Avenue and Swann Avenue	NB	LT	130	0 (29)	0 (7)
		TH	1090	22 (301)	0 (62)
	SB	TH	425	2 (59)	2 (137)
		RT		2 (59)	2 (137)
	EB	LT	415	3 (60)	2 (33)
		RT		4 (62)	2 (36)
Potomac Avenue and E. Custis Avenue	NB	U-Turn	145	0 (12)	0 (15)
		LT		0 (12)	0 (15)
		TH	450	23 (297)	2 (69)
	SB	TH	190	3 (73)	7 (178)
		RT		1 (91)	7 (196)
	EB	LT	430	11 (87)	2 (28)
		RT		14 (97)	3 (38)

Table 3-4: Existing Traffic Analysis Average (Max) Queuing (feet)					
Intersection	**Approach**	**Mvmt**	**Block or Storage Length**	**AM**	**PM**
Potomac Avenue and E. Howell Avenue	NB	U-Turn	100	3 (163)	2 (87)
		LT		3 (163)	2 (87)
		TH	800	3 (163)	2 (87)
	SB	U-Turn	200	0 (55)	1 (109)
		TH		0 (55)	1 (109)
		RT		0 (55)	1 (109)
	EB	LT	290	2 (51)	5 (86)
		RT		4 (56)	8 (91)
Potomac Avenue and Main Line Boulevard	NB	LT	640	30 (190)	6 (91)
		TH		32 (201)	26 (152)
		RT		32 (201)	26 (152)
	SB	LT	600	14 (122)	3 (59)
		TH		14 (122)	3 (59)
		RT		14 (122)	3 (59)
	EB	LT	180	48 (412)	18 (261)
		TH		48 (412)	18 (261)
		RT		26 (351)	4 (200)
	WB	LT	550	7 (88)	71 (416)
		TH		2 (90)	12 (293)
		RT		2 (90)	12 (293)
Commonwealth Avenue & Glebe Road*	NB	LTR	200	41	62
	SB	LTR	350	67	85
	EB	LTR	425	189	146
	WB	LTR	225	86	170
Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue*	NB	T	175	204	169
		R		19	0
	NEB	L	200	201	114
		T	200	#365	148
	SB	T	525	180	292
		R	250	17	19
	SWB	T	1550	173	255
	WB	L	625	0	0

*Analyzed in Synchro /

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Travel Time

Travel time field observations and simulation results are presented in **Table 3-5**. Travel time is generally consistent for US Route 1 and Potomac Avenue for both directions of travel during the peak hours.

Table 3-5: Existing Travel Time (minutes)

Location / Direction	Field Travel Time		Simulated Travel Time	
	AM	PM	AM	PM
US Route 1 Northbound	5.3	4.9	4.5	4.5
US Route 1 Southbound	3.6	4.9	4.4	4.8
Potomac Avenue Northbound	-	-	4.4	3.7
Potomac Avenue Southbound	-	-	5.0	2.9

3.8 EXISTING CONDITIONS SUMMARY

Existing transportation conditions in the study area reflect a subtle yet growing shift from the previous auto-centric focus that governed much of the development along the US Route 1 Corridor. In the past, signal timings along US Route 1 were set to primarily provide for the progression of automobile through traffic. The current signal timings in use along the corridor today were developed to support the through movements of vehicles, safe pedestrian crossings, and reliable headways of the US Route 1 Corridor's transit alternatives, including the Metroway.

Intersection LOS analyses show that all study area intersections operate at overall LOS D or better during both the AM and PM peak hours. It is anticipated that the current and future network of grid streets will continue to efficiently disperse traffic, attracting volumes from US Route 1, and allowing intersections to operate acceptably.

The study area is proximate to regional trails and has a well-developed pedestrian network that is continually improving with the ongoing redevelopment along both sides of US Route 1 and the shift from the today's auto-oriented development to mixed-use, urban, walkable neighborhoods. While there are no on-street bicycle facilities along US Route 1, there are regional and local trails and limited on-street facilities on side streets in the neighborhood grid system.

Potomac Avenue offers a viable alternative to US Route 1. Intersection delays and queuing are generally low and a travel time savings in the peak direction during the peak hours may prove attractive to some commuters. At the same time, Potomac Avenue offers a calmer, more pedestrian and bicycle friendly atmosphere, adjacent to trails and parks, that differs when compared to the more urban footprint of US Route 1.

As parallel corridors, the two streets provide efficient north-south travel, while offering local travelers greater connectivity to neighborhood streets.

4. Analysis of Future Conditions without Development (Background Conditions)

This chapter examines future year conditions without the redevelopment of North Potomac Yard, herein referred to as the "background" conditions. Included in this chapter are descriptions of the background transportation network and background traffic volumes independent of any redevelopment of North Potomac Yard in either the 2010 Plan or Updated Plan land use scenario. Based on guidance from the City of Alexandria, this study contemplates two background years, 2021 and 2040.

4.1 BACKGROUND TRANSPORTATION NETWORK

The following are planned transportation improvements that are anticipated to be completed without the redevelopment of North Potomac Yard. These include:

- **The Potomac Yard Metrorail Station (by 2021) -** A new station for the regional Metrorail system is planned to serve the area. Station entrances are planned east of Potomac Avenue.
- **E. Glebe Road intersection improvements (by 2021)** – Improvement to the lane configuration at the intersection of E. Glebe Road and US Route 1. Includes widening of eastbound approach to have exclusive westbound left, through, and right turn lanes and restriping of westbound approach to have an exclusive left turn lane and a shared through and right turn lane.
- **Swann Avenue intersection improvements (by 2021)** – Improvement to the lane configuration at the intersection of Swann Avenue and US Route 1. Includes restriping eastbound and westbound approaches to have exclusive left turn lanes and a shared through-right turn lanes.
- **Construction of North-South Road (by 2021)** – An additional north-south street, connecting Calvert Avenue to E. Glebe Road as part of the redevelopment of the Oakville Triangle and other developments along the west of US Route 1.
- **Signalization of Montrose Avenue (by 2021)** – Signalization of Montrose Avenue to allow a controlled left turn opportunity along US Route 1 and potentially relieve traffic conditions at E. Glebe Road.
- **Signalization of Fannon Street (by 2021)** – Signalization of Fannon Street for pedestrian crossing movements only.
- **Transit Signal Priority (by 2021) –** Implementation of transit signal priority along US Route 1 to improve transit operations and headways.
- **Custis Avenue intersection improvements (by 2040)** – Improvement to the lane configuration at the intersection of Custis Avenue and US Route 1. Includes restriping eastbound and westbound to have exclusive left turn lanes and a shared through and right turn lanes.
- **Traffic Signal Timing and Phasing Updates (Ongoing)** – Updates to traffic signal timing to enhance efficiency of auto and transit travel, either at the City's initiative or related to redevelopments in the area.

Traffic reassignment associated with these improvements is show in **Appendix F**.

4.2 DERIVATION OF BACKGROUND TRAFFIC VOLUMES

Future traffic volumes are anticipated to grow from existing traffic volumes due to annual regional traffic growth and traffic generated by other nearby approved and unbuilt developments. This increase in traffic volumes is independent of any redevelopment in North Potomac Yard. The factors that influence growth in traffic and the estimated 2021 and 2040 background traffic volumes are subsequently described in the following sections.

Regional Traffic Growth

As a primary north-south corridor in Northern Virginia, US Route 1 serves both local trips and through commuters connecting to the greater regional transportation network. Accordingly, it is common to attribute an annual increase in traffic along such corridors due to the presence of regional trips.

Table 4-1 shows the data from VDOT annual average daily traffic (AADT) counts from 2011 to 2015. This data was reviewed to identify annual trends in traffic growth along US Route 1. The VDOT AADT Reports are contained in **Appendix F**.

Table 4-1: US Route 1 AADT

Street	Average Daily Traffic (veh/day)					Total Annual Traffic Growth					
	2011	2012	2013	2014	2015	2011 to 2012	2012 to 2013	2013 to 2014	2014 to 2015	2011 to 2015	2013 to 2015
US Route 1	40,000	37,000	37,000	36,000	39,000	-7.5%	No change	-2.7%	8.3%	-0.63%	2.7%

Source: Kimley-Horn, Reference: VDOT AADT Reports

Based on a review of VDOT data, daily traffic volumes were relatively stable or decreasing along US Route 1 between 2011 and 2014. The decline and stabilization in traffic volumes may be attributed to traffic diversion to Potomac Avenue, the presence of high-quality transit, and changes in journey to work travel patterns. A significant growth in AADT occurred in 2015; this may be attributed to the further redevelopment of South Potomac Yard and the completion of the Metroway construction along US Route 1.

An unmodified run of the Metropolitan Washington Council of Governments (MWCOG) Travel Demand Model was also reviewed. MWCOG is an independent, nonprofit association that brings area leaders together to address major regional issues. MWCOG also develops, with input from member jurisdictions, a regional travel demand model that considers current and future transportation networks, current and future demographics, and current and future land uses. The model run associated with the Version 2.3.57a Travel Demand Model was evaluated to determine year 2015 and 2040 daily traffic volume projections as shown in **Table 4-2**.

Table 4-2: MWCOG 24-Hour Traffic Volume Forecasts				
Model Year	US Route 1		Potomac Avenue	
	24 Hour Volume	Annual Growth	24 Hour Volume	Annual Growth
2015	22,620	1.295%	1,545	5.169%
2040	31,200		5,447	

The MWCOG model suggests that between 2015 and 2040, US Route 1 will experience a modest annual growth in traffic of approximately 1.3 percent per year while Potomac Avenue's growth will be more significant at an annual growth of 5.2 percent per year. It is noted that the MWCOG model includes the redevelopment of North and South Potomac Yard and the parcels west of US Route 1 (including Oakville Triangle):

- Between 2015 and 2040, the traffic analysis zone (TAZ) that contains North Potomac Yard is estimated to have annual increases in households, population, employment of 6.6 percent, 6.6 percent, and 10.3 percent, respectively.
- Between 2015 and 2040, the TAZ that contains South Potomac Yard is estimated to have annual increases in households, population, employment of 0.94 percent, 0.94 percent, and 10.1 percent respectively.
- Between 2015 and 2040, the TAZ that contains Oakville Triangle is estimated to have annual increases in households, population, employment of 2.3 percent, 2.1 percent, and 0.3 percent respectively.

Accordingly, the MWCOG derived annual traffic growth is a combination of traffic generated by redeveloped land uses and regional through trips. To reconcile the apparent stabilization of traffic volumes prior to 2015, the growth of traffic related to specific developments (which will be calculated separately), and the conservative assumption of increased regional through trips, a one percent per year traffic growth factor was applied to the existing northbound and southbound through movement volumes along US Route 1, up to a maximum growth of 10 percent. This one percent yearly growth factor is consistent with the factor used in the 2010 North Potomac Yard Multimodal Transportation Study, the Oakville Triangle and Route 1 Planning Corridor Multimodal Transportation Study, and the Old Town North Small Area Plan update. This factor is representative of non-specific city growth and growth in regional through trips. Existing traffic volumes, grown to year 2021 and 2040 traffic volumes are shown in **Appendix F**.

Planned Background Developments

A list of nearby approved and unbuilt developments was compiled by the City of Alexandria for inclusion in this study. The locations of the approved and unbuilt developments are shown on **Figure 4-1**.

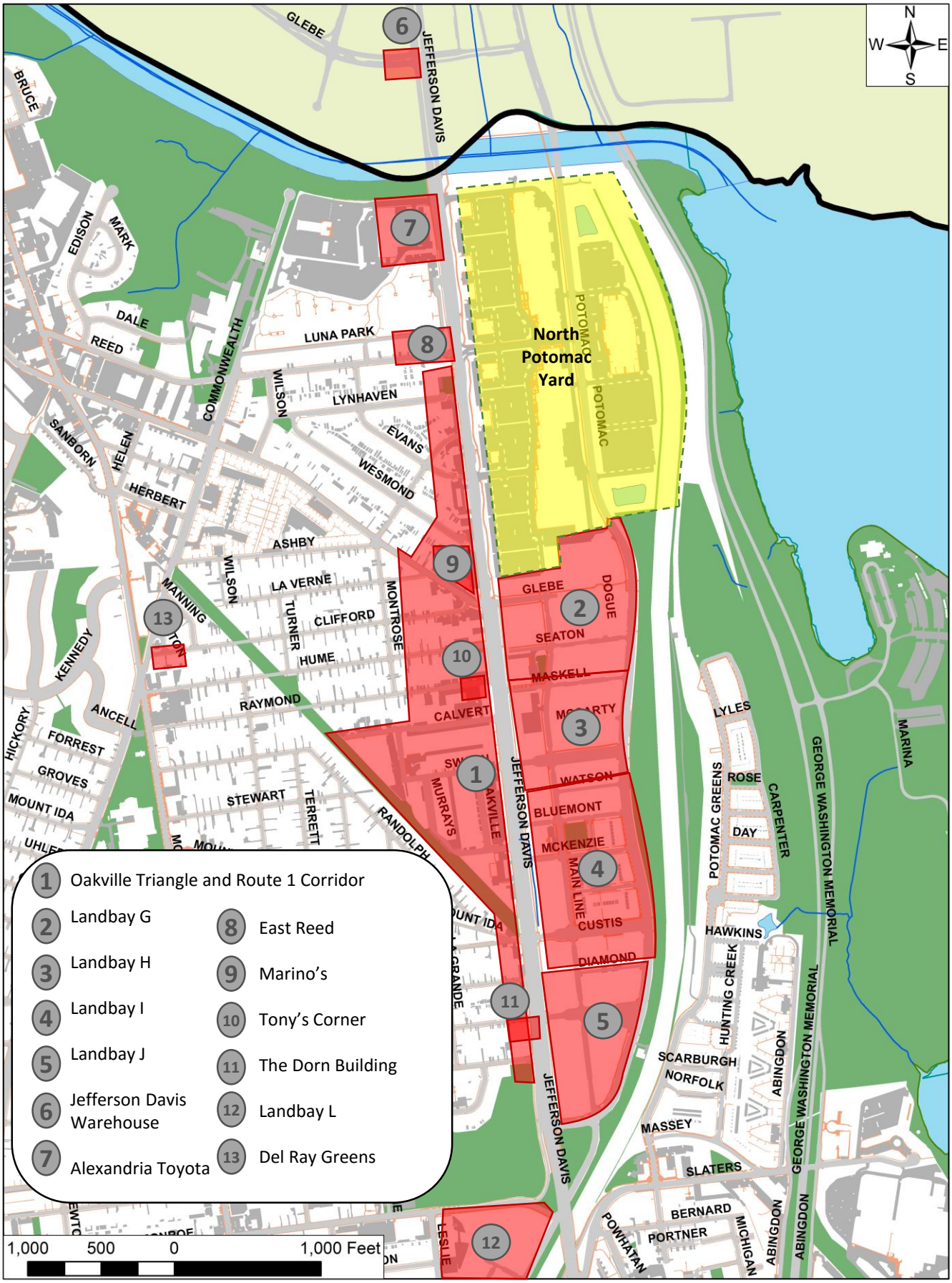


Figure 4-1: Approved and Unbuilt Development Locations

The forecasted peak hour person-trips generated by each development were determined using the Institute of Transportation Engineers Trip Generation Manual, 9th Edition and mode split assumptions for the study area (described in **Chapter 5.2**). Per previously approved methodology, the resulting auto person-trips are assumed to represent the number of vehicle trips (i.e. there is a conservative auto occupancy assumption of one person per vehicle).

Traffic generated by the approved and unbuilt developments is summarized in **Table 4-3** and **Table 4-4**. The development levels and assumptions provided by the City's Planning and Zoning Department are contained in **Appendix G**.

The assignment of the trips generated by the approved and unbuilt developments was based on an assumed trip distribution (described in **Chapter 5.7**). The 2021 and 2040 approved and unbuilt peak hour traffic volumes are shown in **Figure 4-2** and **Figure 4-3**.

The peak hour trip assignments for each development are also shown in **Appendix G**.

Background Traffic Volume Summary

The future peak hour turning movement volumes without redevelopment of North Potomac Yard were calculated by increasing the existing traffic volumes using the annual growth factor along US Route 1 and then adding the traffic generated by the approved and unbuilt developments, with further adjustment to area traffic that is a result of the background transportation improvements. The peak hour turning movement volumes at the study area intersections are shown in **Figure 4-4 and Figure 4-5** for 2021 and 2040, respectively.

4.3 BACKGROUND CONDITIONS TRANSPORTATION ANALYSES

Background transportation conditions were not analyzed as part of this study. As previously discussed, the redevelopment of North Potomac Yard has already been approved by the City of Alexandria. The specific purpose of this transportation study is to compare the transportation impacts associated with the Updated Plan in comparison to the current approval of North Potomac Yard (the 2010 Plan). Accordingly, the analysis of background conditions is not relevant to this study. This assumption was agreed to by the City of Alexandria. Background traffic volumes, however, represent a component of the 2010 Plan and Updated Plan volumes to be analyzed subsequently.

4.4 BACKGROUND CONDITIONS SUMMARY

Prior to the redevelopment of North Potomac Yard, the US Route 1 corridor will experience a growth in traffic related to commuter trips and approved and unbuilt developments. There are also planned and programmed transportation network enhancements that will serve to lessen the impact of this growth in vehicular traffic.

Table 4-3: 2021 Approved and Unbuilt Developments Peak Hour Trip Generation								
Development	Size	AM Peak Hour			PM Peak Hour			Daily
		Total	In	Out	Total	In	Out	
South Potomac Yard Landbay G								
Retail	68,817 SF	47	21	26	187	82	105	2982
Transit (Metrorail - 29%)		13	5	8	54	23	31	865
Transit (Metrobus, Dash, Metroway - 8%)		4	2	2	15	7	8	238
Pedestrian & Bicycle (27%)		13	6	7	51	22	29	805
Auto (36%)		17	8	9	67	30	38	1074
Multifamily Residential	506 DU	194	60	134	232	135	97	1979
Transit (Metrorail - 29%)		56	17	39	67	39	28	575
Transit (Metrobus, Dash, Metroway - 8%)		16	5	11	18	11	7	158
Pedestrian & Bicycle (27%)		52	16	36	63	36	27	534
Auto (36%)		70	22	48	84	49	35	712
SPY Landbay G Office	378,896 SF	555	488	67	503	86	417	3,613
Transit (Metrorail - 21%)		117	103	14	106	18	88	759
Transit (Metrobus, Dash, Metroway - 9%)		50	44	6	45	8	37	325
Pedestrian & Bicycle (6%)		33	29	4	30	5	25	217
Auto (64%)		355	312	43	322	55	267	2312
SPY Landbay G Hotel	170 DU	82	55	27	94	39	55	1,061
Transit (Metrorail - 27%)		22	15	7	25	11	15	286
Transit (Metrobus, Dash, Metroway - 4%)		3	2	1	4	2	2	42
Pedestrian & Bicycle (31%)		26	17	9	29	11	17	330
Auto (38 %)		31	21	10	36	15	21	403
SPY Landbay G Multifamily	646	238	74	164	288	167	121	2527
Transit (Metrorail - 48%)		77	24	53	94	54	40	838
Transit (Metrobus, Dash, Metroway - 1%)		16	5	11	19	11	8	164
Pedestrian & Bicycle (15%)		59	18	41	71	41	30	616
Auto (36%)		86	27	59	104	61	43	909
SPY Landbay G Auto Total		559	390	169	613	210	404	5,410
South Potomac Yard Landbay H								
SPY Landbay H Office	600,000 DU	802	706	96	750	128	622	5,124
Transit (Metrorail - 21%)		169	148	21	157	27	130	1,077
Transit (Metrobus, Dash, Metroway - 9%)		72	64	8	68	11	57	461
Pedestrian & Bicycle (6%)		48	42	6	45	8	37	307
Auto (64%)		513	452	61	480	82	398	3,279
Retail	5,000 SF	8	4	4	33	15	18	252
Transit (Metrorail - 29%)		2	1	1	10	5	5	73

Table 4-3: 2021 Approved and Unbuilt Developments Peak Hour Trip Generation								
Development	Size	AM Peak Hour			PM Peak Hour			Daily
		Total	In	Out	Total	In	Out	
Transit (Metrobus, Dash, Metroway - 8%)		1	1	0	2	1	1	20
Pedestrian & Bicycle (27%)		2	1	1	9	4	5	68
Auto (36%)		3	1	2	12	5	7	91
Townhouse	16 DU	12	2	10	13	9	4	63
Transit (Metrorail - 48%)		6	1	5	6	4	2	30
Transit Metrobus, Dash, Metroway - 1%)		0	0	0	0	0	0	1
Pedestrian & Bicycle (15%)		2	0	2	1	1	0	9
Auto (36%)		4	1	3	5	3	2	23
Multifamily Residential	286	91	29	62	115	66	49	1,119
Transit (Metrorail - 48%)		27	9	18	35	20	15	352
Transit Metrobus, Dash, Metroway - 1%)		7	2	5	9	5	4	79
Pedestrian & Bicycle (15%)		24	8	16	30	17	13	285
Auto (36%)		33	10	23	41	24	17	403
SPY Landbay H (Auto) Total		553	464	89	538	114	424	3,796
Oakville Triangle								
Townhouse	26 DU	18	3	15	20	13	7	199
Transit (Metro Rail - 31%)		6	1	5	6	4	2	62
Transit (Metrobus, Dash, Metroway - 5%)		1	0	1	1	1	0	10
Pedestrian & Bicycle (10%)		1	0	1	2	1	1	20
Auto (54%)		10	2	8	11	7	4	107
Mid Rise Apartments	1024 DU	407	126	281	480	278	202	4,006
Transit (Metro Rail - 31%)		126	39	87	149	86	63	1,242
Transit (Metrobus, Dash, Metroway - 5%)		20	6	14	24	14	10	200
Pedestrian & Bicycle (10%)		41	13	28	48	28	20	401
Auto (54%)		220	68	152	259	150	109	2,163
Hotel	189 Rooms	91	61	30	104	44	60	1179
Transit (Metro Rail - 27%)		25	16	8	28	12	16	318
Transit (Metrobus, Dash, Metroway - 4%)		4	2	1	4	2	2	47
Pedestrian & Bicycle (31%)		27	20	9	32	13	19	366
Auto (38%)		35	23	12	40	17	23	448
Specialty Retail	105,938 SF	69	30	39	276	121	155	4,570
Transit (Metro Rail - 29%)		20	9	11	80	35	45	1,325
Transit (Metrobus, Dash, Metroway - 8%)		6	2	3	22	10	12	366
Pedestrian & Bicycle (27%)		18	8	11	75	32	43	1,234
Auto (36%)		25	11	14	99	44	55	1,645

Table 4-3: 2021 Approved and Unbuilt Developments Peak Hour Trip Generation								
Development	Size	AM Peak Hour			PM Peak Hour			Daily
		Total	In	Out	Total	In	Out	
Office	132,181 SF	239	210	29	226	38	188	1,623
Transit (Metro Rail - 10%)		24	21	3	23	4	19	162
Transit (Metrobus, Dash, Metroway - 9%)		22	19	3	20	3	17	146
Pedestrian & Bicycle (6%)		14	12	2	13	2	11	98
Auto (75%)		179	158	21	170	29	141	1,217
High Turnover Restaurant	61,723 SF	667	367	300	608	365	243	7,848
Transit (Metro Rail - 29%)		193	106	87	176	106	70	2,276
Transit (Metrobus, Dash, Metroway - 8%)		53	29	24	49	29	19	628
Pedestrian & Bicycle (27%)		181	100	81	164	99	66	2,119
Auto (36%)		240	132	108	219	131	88	2,825
Pass-by Auto (43% of Auto)		-	-	-	-94	-47	-47	-
Total Oakville Triangle (New Auto) trips		709	394	315	704	331	373	8405
2021 Route 1 Planning Corridor Study Area								
Mid-rise Apartments	198 DU	68	21	47	84	49	35	775
Transit (Metro Rail - 31%)		21	7	14	26	15	11	240
Transit (Metrobus, Dash, Metroway - 5%)		3	1	2	5	4	1	38
Pedestrian & Bicycle (10%)		7	2	5	8	4	4	78
Auto (54%)		37	11	26	45	26	19	419
Townhouse	66 DU	37	6	31	43	29	14	448
Transit (Metro Rail - 31%)		11	1	10	13	9	4	139
Transit (Metrobus, Dash, Metroway - 5%)		2	1	1	3	1	2	22
Pedestrian & Bicycle (10%)		4	1	3	4	3	1	45
Auto (54%)		20	3	17	23	16	7	242
Specialty Retail	30,000 SF	23	10	13	93	41	52	1,321
Transit (Metro Rail - 29%)		7	3	4	27	12	15	383
Transit (Metrobus, Dash, Metroway - 8%)		2	1	1	7	3	4	106
Pedestrian & Bicycle (27%)		6	2	4	26	11	15	356
Auto (36%)		8	4	4	33	15	18	476
By Others (Auto) Trips		65	18	47	101	57	44	1,137
South Potomac Yard Landbay I								
Townhouse	161 DU	76	13	63	89	60	29	973
Transit (Metrorail - 31%)		23	4	19	28	19	9	302
Transit (Metrobus, Dash, Metroway - 5%)		4	1	3	4	3	1	49
Pedestrian & Bicycle (10%)		8	1	7	9	6	3	97
Auto (54%)		41	7	34	48	32	16	525

Table 4-3: 2021 Approved and Unbuilt Developments Peak Hour Trip Generation								
Development	Size	AM Peak Hour			PM Peak Hour			Daily
		Total	In	Out	Total	In	Out	
Multifamily Residential	135 DU	42	13	29	54	31	23	528
Transit (Metrorail - 31%)		13	4	9	17	10	7	164
Transit (Metrobus, Dash, Metroway - 5%)		2	1	1	3	1	2	26
Pedestrian & Bicycle (10%)		4	1	3	5	3	2	53
Auto (54%)		23	7	16	29	17	12	285
Landbay I (Auto) Total		64	14	50	77	49	28	810
South Potomac Yard Landbay J								
Retail	5,000 SF	8	4	4	33	15	18	252
Transit (Metrorail - 29%)		2	1	1	10	5	5	73
Transit (Metrobus, Dash, Metroway - 8%)		1	1	0	2	1	1	20
Pedestrian & Bicycle (27%)		2	1	1	9	4	5	68
Auto (36 %)		3	1	2	12	5	7	91
Townhouse	151 DU	72	12	60	84	56	28	921
Transit (Metrorail - 31%)		22	4	18	27	17	10	286
Transit (Metrobus, Dash, Metroway - 5%)		4	1	3	4	3	1	46
Pedestrian & Bicycle (10%)		7	1	6	8	6	2	92
Auto (54%)		39	6	33	45	30	15	497
Multifamily Residential	183 DU	62	19	43	77	45	32	716
Transit (Metrorail - 31%)		20	6	14	23	14	9	221
Transit (Metrobus, Dash, Metroway - 5%)		3	1	2	4	2	2	36
Pedestrian & Bicycle (10%)		6	2	4	8	5	3	72
Auto (54%)		33	10	23	42	24	18	387
Landbay J (Auto) Total		75	17	58	99	59	40	975
South Potomac Yard Landbay L								
Retail	5,000 SF	8	4	4	33	15	18	252
Transit (Metrorail - 29%)		2	1	1	10	5	5	73
Transit (Metrobus, Dash, Metroway - 8%)		1	1	0	2	1	1	20
Pedestrian & Bicycle (27%)		2	1	1	9	4	5	68
Auto (36%)		3	1	2	12	5	7	91
Townhouse	165 DU	77	13	64	91	61	30	994
Transit (Metrorail - 31%)		24	4	20	28	19	9	308
Transit (Metrobus, Dash, Metroway - 5%)		4	2	3	5	3	2	50
Pedestrian & Bicycle (10%)		7	1	6	9	6	3	99
Auto (54%)		42	7	35	49	33	16	537
SPY Landbay L Multifamily	276 DU	100	31	69	121	70	51	1,080

Table 4-3: 2021 Approved and Unbuilt Developments Peak Hour Trip Generation								
Development	Size	AM Peak Hour			PM Peak Hour			Daily
		Total	In	Out	Total	In	Out	
Transit (Metrorail - 31%)		31	10	21	38	22	16	335
Transit (Metrobus, Dash, Metroway - 5%)		5	1	4	6	3	3	54
Pedestrian & Bicycle (10%)		10	3	7	12	7	5	108
Auto (54%)		54	17	37	65	38	27	583
Landbay L (Auto) Total		99	25	74	126	76	50	1,211
The Dorn Building	2,956 SF	11	10	1	82	14	68	90
Tony's Corner	10,525 SF	12	5	7	47	21	26	488
Transit (Metrorail - 29%)		4	2	2	14	6	8	141
Transit (Metrobus, Dash, Metroway - 8%)		1	0	1	4	2	2	39
Pedestrian & Bicycle (27%)		3	1	2	13	6	7	132
Auto (36%)		4	2	2	16	7	9	176
Pass-by		-	-	-	-10	-4	-6	-
Tony’s Corner (Auto) Total		4	2	2	6	3	3	176
Anthony's Auto Ext.	9,040 SF	20	13	7	28	13	15	-
East Reed AHC Multifamily	54 DU	9	3	6	15	9	6	211
East Reed Townhomes	5 DU	5	1	4	5	3	2	47
Marino's Restaurant Ext.	2,547 SF	28	15	13	25	15	10	324
Jefferson Davis Warehouse	11,500 SF	25	20	5	15	4	11	77
Alexandria Toyota Extension	13,000 SF	29	19	10	40	19	21	-
2021 A&U Auto Mode Total		2,255	1,405	850	2,474	976	1,499	22,669

Table 4-4: 2040 Additional Approved and Unbuilt Developments Peak Hour Trip Generation								
Development	Size	AM Peak Hour			PM Peak Hour			Daily
		Total	In	Out	Total	In	Out	
Route 1 Planning Corridor Study Area								
Multifamily	234 DU	83	26	57	101	59	42	915
Transit (Metro Rail - 31%)		26	8	18	31	18	13	284
Transit (Metrobus, Dash, Metroway - 5%)		4	2	2	5	3	2	45
Pedestrian & Bicycle (10%)		8	2	6	10	6	4	92
Auto (54%)		45	14	31	55	32	23	494
Townhouse	78 DU	42	7	35	49	33	16	518
Transit (Metro Rail - 31%)		13	2	11	15	10	5	161
Transit (Metrobus, Dash, Metroway - 5%)		2	0	2	3	2	1	25
Pedestrian & Bicycle (10%)		4	1	3	5	3	2	52
Auto (54%)		23	4	19	26	18	8	280
Specialty Retail	40,000 SF	29	13	16	117	51	66	1,749
Transit (Metro Rail - 29%)		8	3	5	34	15	19	507
Transit (Metrobus, Dash, Metroway - 8%)		3	1	2	9	4	5	140
Pedestrian & Bicycle (27%)		8	4	4	32	14	18	472
Auto (36%)		10	5	5	42	18	24	630
By Others (Auto) Trips		78	23	55	123	68	55	1,404
South Potomac Yard Landbay G (Additional)								
Office	602,450 SF	805	708	97	753	128	625	5,140
Transit (Metrorail - 21%)		169	149	20	158	27	131	1,079
Transit (Metrobus, Dash, Metroway - 9%)		73	64	9	68	11	57	463
Pedestrian & Bicycle (6%)		48	42	6	45	8	37	308
Auto (64%)		515	453	62	482	82	400	3,290
Retail	31,000 SF	24	11	13	96	42	54	1,364
Transit (Metrorail - 29%)		7	3	4	28	12	16	396
Transit (Metrobus, Dash, Metrobus - 8%)		2	1	1	7	3	4	109
Pedestrian & Bicycle (27%)		6	3	3	26	11	15	368
Auto (36%)		9	4	5	35	15	20	491
SPY Landbay G (Auto) Total		524	457	67	517	97	420	3,781
South Potomac Yard Landbay H (Additional)								
Office	500,000 SF	693	610	83	638	108	530	4,461
Transit (Metrorail - 21%)		146	128	18	134	23	111	937
Transit (Metrobus, Dash, Metroway - 9%)		62	55	7	58	10	48	401
Pedestrian & Bicycle (6%)		41	37	4	38	6	32	268

Table 4-4: 2040 Additional Approved and Unbuilt Developments Peak Hour Trip Generation								
Development	Size	AM Peak Hour			PM Peak Hour			Daily
		Total	In	Out	Total	In	Out	
Auto (64%)		444	390	54	408	69	339	2,855
Retail	20,000 SF	17	7	10	69	30	39	893
Transit (Metrorail - 29%)		5	2	3	20	9	11	259
Transit (Metrobus, Dash, Metrobus - 8%)		1	0	1	6	2	4	72
Pedestrian & Bicycle (27%)		5	2	3	18	8	10	241
Auto (36%)		6	3	3	25	11	14	321
SPY Landbay H (Auto) Total		450	393	57	433	80	353	3,176
2040 Additional A&U Auto Mode Total		1,052	873	179	1,073	245	828	8,361

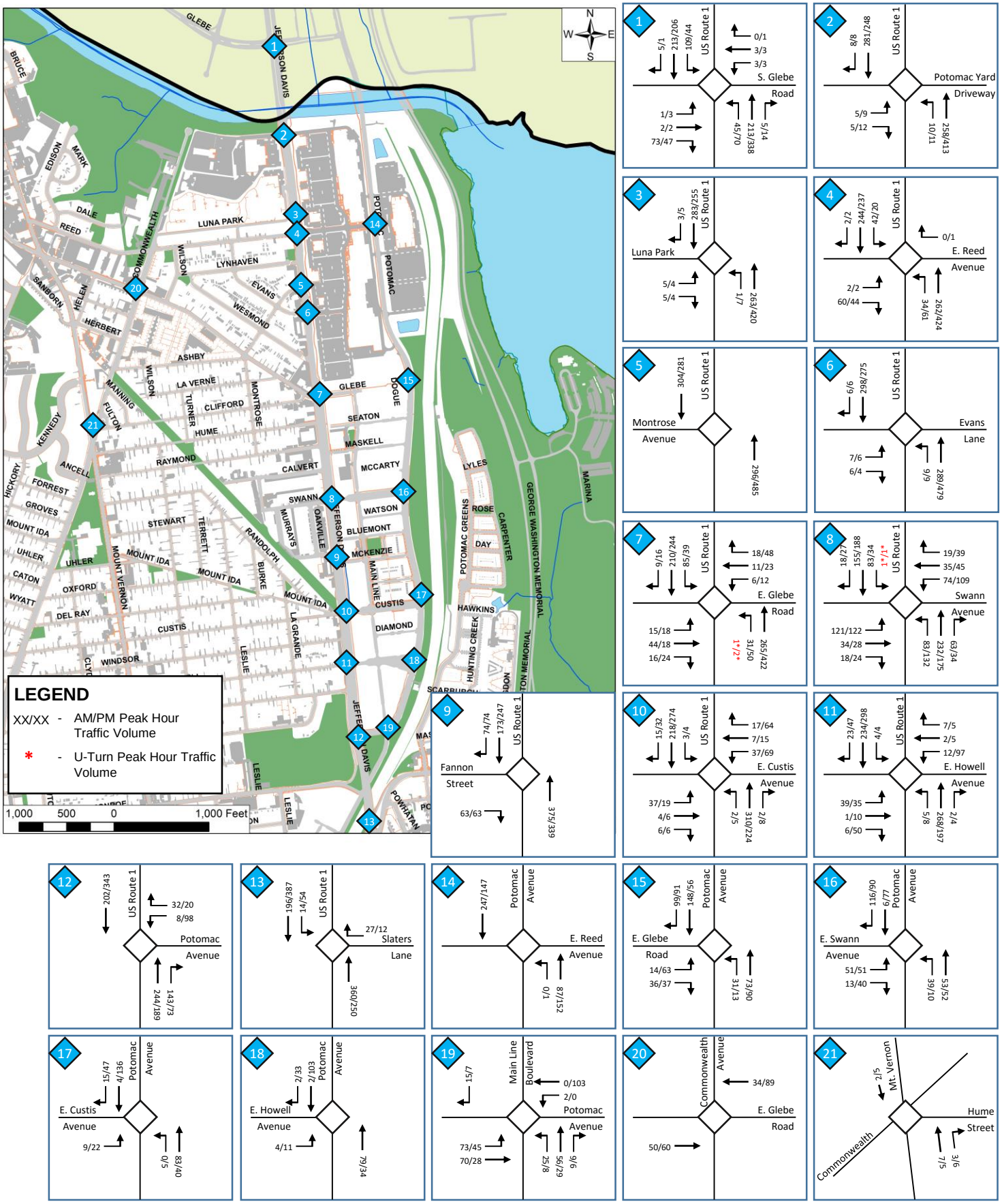


Figure 4-2: 2021 Approved and Unbuilt Development Peak Hour Traffic Volumes

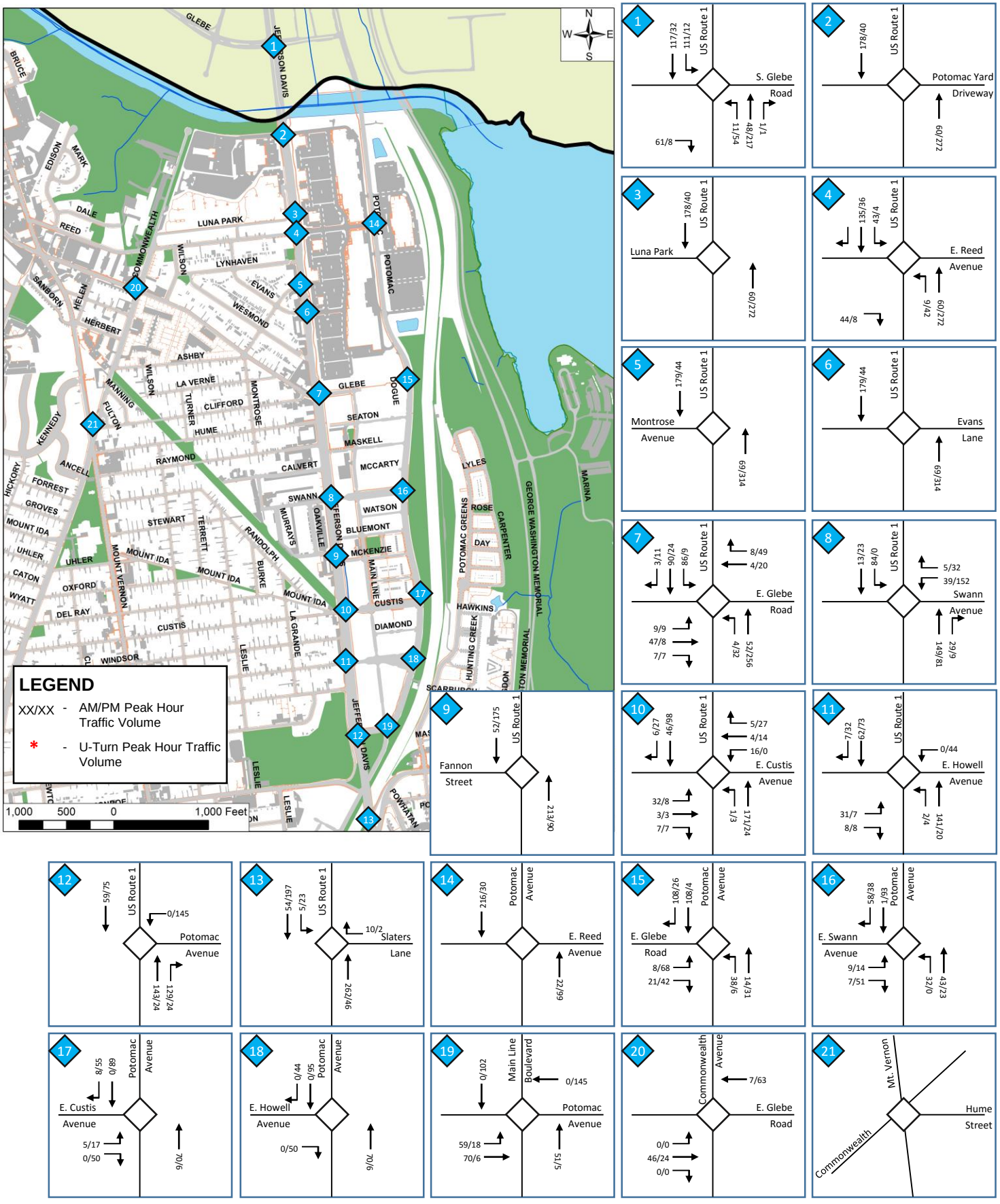


Figure 4-3: 2040 Approved and Unbuilt Development Peak Hour Traffic Volumes

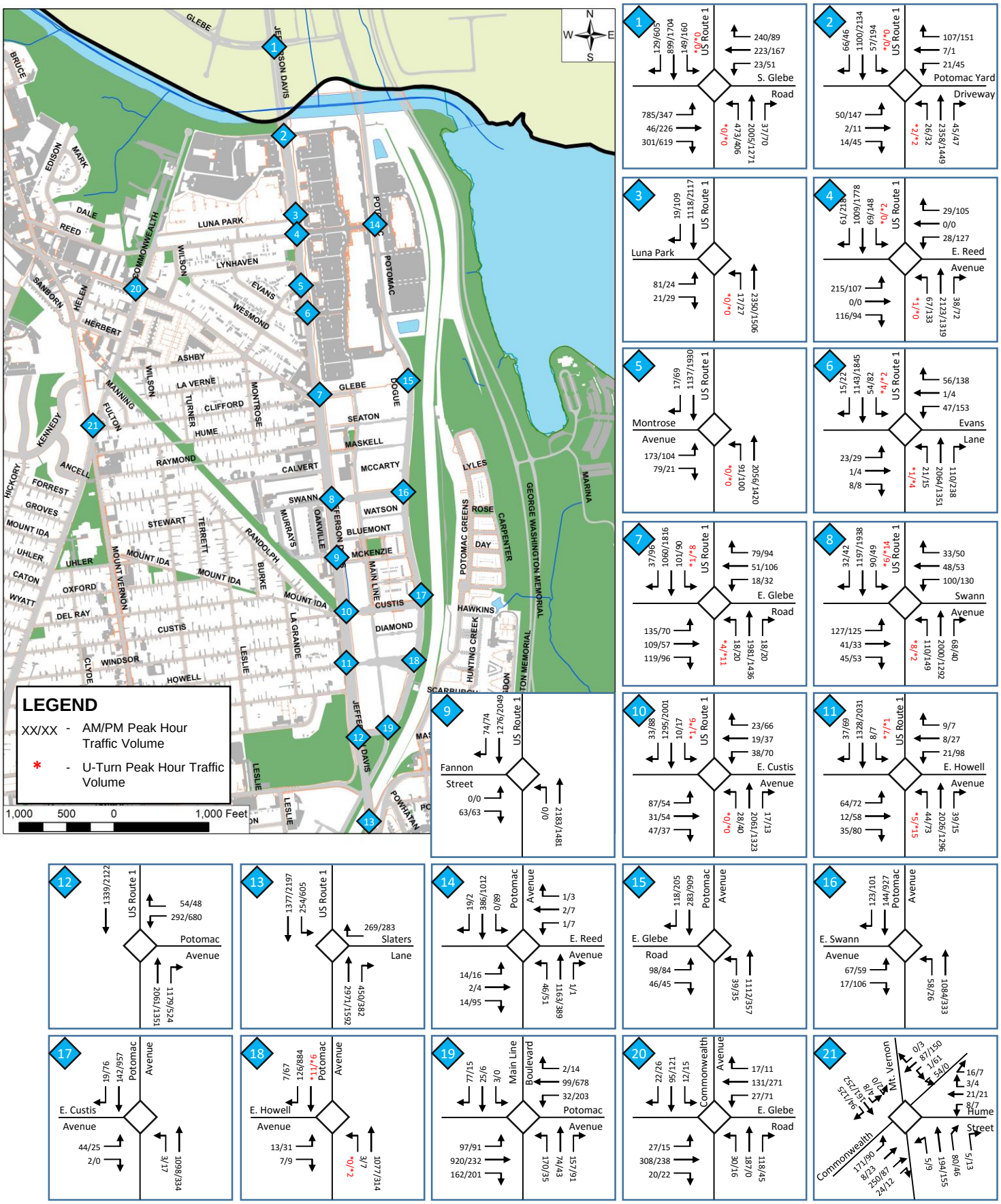


Figure 4-4: 2021 Background Peak Hour Traffic Volumes

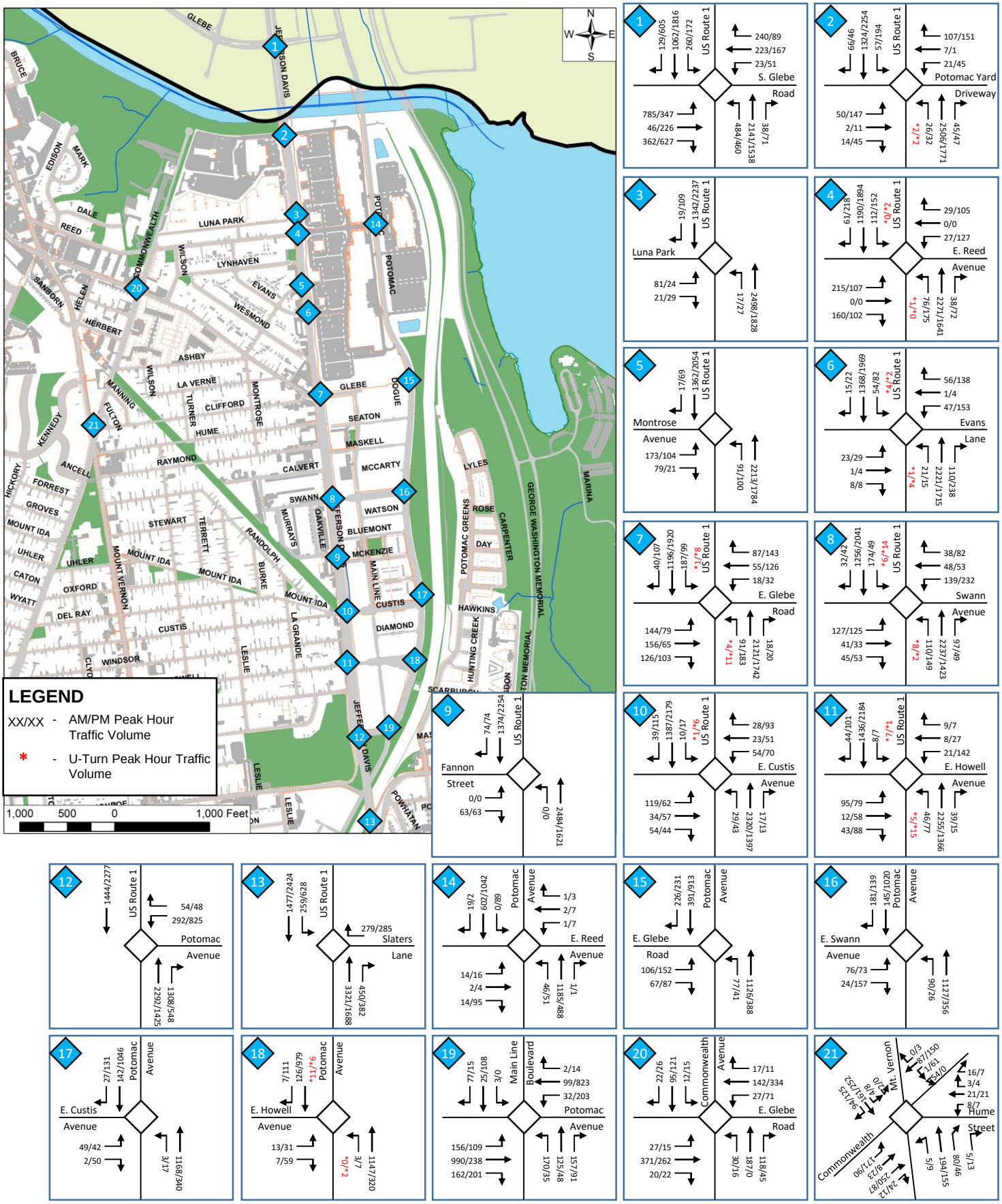


Figure 4-5: 2040 Background Peak Hour Traffic Volumes

5. Trip Generation, Distribution, and Assignment

5.1 OVERVIEW

This chapter describes the calculation of site generated trips for both the 2010 Plan and the Updated Plan. Included in the calculation of site generated trips are credits for trips generated by the existing development on site, the calculation of person trips generated by the different land uses of the 2010 Plan and the Updated Plan, mode split, pass-by, internal capture, calculation of trips by mode, trip distribution, and trip assignment.

5.2 EXISTING TRIP CREDIT

As discussed in **Chapter 2**, North Potomac Yard currently contains a 600,000-square foot retail shopping center that includes specialty retail, large format retail, and a theatre. The redevelopment of North Potomac Yard will replace these uses; accordingly, for the analysis of future conditions, the traffic generated by the existing uses on site was removed from consideration. This was done by reviewing the traffic counts at the study intersections that also serve as entrances into and out of the current North Potomac Yard shopping center and removing the traffic volumes from the network.

Turning volumes were removed from the following intersections:

- US Route 1 and Potomac Yard Driveway. Potomac Yard Driveway is the street opposite the Toyota Dealership.
- US Route 1 and E. Reed Avenue.
- US Route 1 and Evans Lane.
- Potomac Avenue and E. Reed Avenue.

The turning volumes were then “backed out” of the network along US Route 1 and along Potomac Avenue. It is noted that along Potomac Avenue, there are additional unsignalized entrances to the North Potomac Yard shopping center that were not counted as part of the data collection effort. Accordingly, credit for existing trips that use these entrances was not calculated. This results in a more conservative assessment of future traffic along Potomac Avenue.

Different trip credits were taken for 2021 and 2040 based on the partial and total replacement of existing uses. These peak hour trip credits are shown in **Appendix H**. The trip credits were applied consistently for the analysis of both the 2010 Plan and the Updated Plan.

5.3 SITE PERSON TRIP GENERATION

In accordance with past practice for the transportation studies for the 2010 Plan and for Oakville Triangle and approval by the City staff for this study of the Updated Plan, the trip generation rates found in the 9th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual were considered to represent person-trips generated by development.

North Potomac Yard will be developed in phases. Phase I is planned to be completed in 2021 and full build-out is planned to be completed by 2040. Site person trips were calculated for both the 2010 Plan and the Updated Plan.

2010 Plan Person Trip Generation

The 2010 Plan consists of the following full build-out quantities:

- Office: 1,475,000 square feet
- Retail
  - 170,000 square feet large-format retail
  - 70,00 square feet grocery store
  - 670,00 square feet specialty retail
  - 90,000 square feet movie theatre
- Residential: 4,750 dwelling units
- Hotel: 300 Rooms square feet

These quantities assumed 100 percent residential use in the office-residential "flex" zone. At the time of the 2010 Plan approval, no specific phasing of development was identified. As part of the transportation study prepared for the Oakville Triangle and Route 1 Corridor Vision Plan, the City of Alexandria Planning and Zoning staff forecasted levels of future activity for North Potomac Yard that could be expected to be completed by 2021 under the 2010 Plan. This future 2021 or "Phase I" activity under the 2010 Plan included 50,000 square feet of commercial retail and 489 multifamily residential units. The resulting person trip generation for Phase I of the 2010 plan is described in **Table 5-1**.

Table 5-1: Phase I Person Trip Generation (2010 Plan)

LAND USE		AM TOTAL	AM IN	AM OUT	PM TOTAL	PM IN	PM OUT	Daily
Specialty Retail	50,000 SF	35	15	20	141	62	79	2,177
Mid-Rise Apartment	489 DUs	187	58	129	224	130	94	1,913
	Total	**301**	**94**	**207**	**396**	**222**	**174**	**3,730**

The person trip generation for full build-out of the 2010 Plan assumptions is described in **Table 5-2**.

Table 5-2: Full Build-Out Person Trip Generation (2010 Plan)

LAND USE		AM TOTAL	AM IN	AM OUT	PM TOTAL	PM IN	PM OUT	Daily
Specialty Retail	670,000 SF	407	179	228	1629	717	912	28,700
Retail Shopping Center	170,000 SF	215	133	82	855	410	445	9,588
Grocery/supermarket	70,000 SF	238	148	92	598	305	293	6,078
Mid-Rise Apartment	4,750 DUs	1,934	600	1,334	2,269	1,316	953	18,581
Office	1,475,000 SF	1,648	1,450	198	1,730	294	1,436	10,150
Cinema	90,000 Sf	0	0	0	442	274	168	9,360
Hotel	300 SF	144	96	48	165	69	96	1872
	Total	**4,348**	**2,458**	**1,890**	**7,090**	**3,080**	**4,010**	**78,251**

Updated Plan Person Trip Generation

The Updated Plan has been detailed to include a specific, phased program of development with a revised set of land use assumptions. Specifically, JBG proposes a reallocation of land uses in the Updated Plan to anticipate greater levels of office development compared to the 2010 Plan. Additionally, certain land uses will be located in closer proximity to the proposed Metrorail Station than was considered in the 2010 plan, further affecting mode split. The proposed Phase I consists of the following development quantities:

- Office: 141,400 square feet
- Residential: +/-774,875 square feet (737 DUs, assumed to be mid-rise apartments for analysis)
- Hotel: 87,100 square feet (150 Rooms)
- Retail: 298,650 square feet
    - 64,000 square feet anchor retail
    - 60,430 square feet inline retail
    - 29,220 square feet restaurant
    - 100,000 square feet gym
    - 45,000 square feet cinema

Person trips were calculated using the appropriate ITE land use code for the gross quantify of each land use. The resulting person trip generation and ITE land use codes for Phase I of the Updated Plan is shown in **Table 5-3**.

Table 5-3: Phase I Person Trip Generation for the (Updated Plan)

ITE Code	Land Use	Units	IN	OUT	TOTAL	IN	OUT	TOTAL	Daily
445	CINEMA	45,000 SF	-	-	-	137	84	221	4,680
492	GYM	100,000 SF	71	70	141	201	152	353	3,293
820	RETAIL - Shopping Center (anchor)	64,000 SF	74	45	119	213	231	444	5,081
826	RETAIL - Specialty (inline)	60,430 SF	26	16	42	73	94	167	2,623
932	RESTAURANT	29,220 SF	174	142	316	173	115	288	3,715
710	OFFICE	141,400 SF	222	30	252	40	197	237	1,708
311	HOTEL	150 Rooms	48	24	72	35	48	83	936
223	RESIDENTIAL	737 DUs	90	199	289	199	144	343	2,883
		Total	**705**	**526**	**1,231**	**1,071**	**1,065**	**2,136**	**24,919**

The proposed full build-out of the Updated Plan consists of the following development quantities:

- Hotel: 169,900 square feet (300 rooms)
- Office: +/- 2,850,500 square feet
- Residential Uses: +/- 3,574,600 square feet (3,365 dwelling units, assumed to be mid-rise apartments for analysis)
- Retail: 930,000square feet
    - 504,750 square feet anchor retail
    - 163,970 square feet inline retail
    - 116,280 square feet restaurant
    - 100,000 square feet gym
    - 45,000 square feet cinema

The resulting person trip generation and ITE land use codes for full build-out of the Updated Plan is shown in **Table 5-4.**

Table 5-4: Full Build-Out Person Trip Generation (Updated Plan)

ITE Code	Land Use	Units	IN	OUT	TOTAL	IN	OUT	TOTAL	Daily
445	CINEMA	45,000 SF	-	-	-	137	84	221	4,680
492	GYM	100,000 SF	71	70	141	201	152	353	3,293
820	RETAIL - Shopping Center (anchor)	504,750 SF	260	159	419	851	921	1,772	19,451
826	RETAIL - Specialty (inline)	163,970 SF	64	40	104	183	232	415	7,052
932	RESTAURANT	116,280 SF	691	566	1,257	687	458	1,145	14,785
710	OFFICE	2,850,500 SF	2,456	335	2,791	556	2715	3,271	16,747
311	HOTEL	300 Rooms	96	48	144	69	96	165	1,872
223	RESIDENTIAL	3,365 DUs	424	943	1,367	930	674	1,604	13,163
		Total	**4,062**	**2,161**	**6,223**	**3,614**	**5,332**	**8,946**	**81,043**

It is recognized that the land use scenarios contained in the subsequent development applications may vary in the type and location of density. The final build-out is expected to be within the order of magnitude of the densities that are the subject of this study and identified above.

5.4 MODE SPLIT ASSUMPTIONS

To accurately represent the anticipated trip-making patterns associated with the redevelopment of North Potomac Yard, mode split assumptions were applied. The mode split assumptions further stratify the person trips generated by their travel mode. The mode split assumptions were previously developed during the preparation of the 2010 Plan and refined during the preparation of the Oakville Triangle and Route 1 Corridor Vision Plan.

Today, US Route 1 is an auto-centric Corridor. The mode split assumptions recognize a shift in travel behavior, encouraged by the by the presence of high-quality transit options and a growing number of pedestrian and bicycle facilities. Trip generation in the area will be heavily influenced by the availability of regional (Metrorail) and local transit (DASH, Metrobus, Metroway). The redevelopment of North Potomac yard will also support the City's multimodal transportation goals and potential future shifts in mode split from personal autos to alternative travel modes. The general assumptions for mode split are shown in **Table 5-3**. The appropriate mode split percentages were applied to the trips generated by both the approved and unbuilt developments (**Chapter 4**) and to the North Potomac Yard based on land uses and proximity to the Metrorail Station entrances. The development plan for North Potomac Yard includes a Metrorail station entrance located east of the future intersection of Potomac Avenue and Evans Lane.

It is noted that the 2010 Plan was based on a much more general development program with regards to the types and locations of land uses that would be considered. An assumption was developed during the Transportation Study prepared for the Oakville Triangle and Route 1 Corridor Vision Plan that the mode split categories for the range of ¼ to ½ mile from the Metrorail Station entrance would be applied to the entire development of North Potomac Yard under the generalized 2010 Plan. This assumption has been carried forward into this study's analysis of the 2010 Plan. This assumption serves to reconcile some of the differences in the office/residential flex zone usage assumptions (and resulting person-trips generated) when comparing the Updated Plan to the 2010 Plan.

In contrast, the Updated Plan contains much greater detail regarding the types and locations of land uses and garage entrances to be considered with the redevelopment of North Potomac Yard. Accordingly, for the analysis of the Updated Plan densities mode split factors were applied to land uses for each block on the site based on proximity to the Metrorail station entrance. It was further assumed that should any portion of the block fall within the closer proximity, the entire block would have that mode split. Lastly, the use of the "adjacent" to Metrorail mode split category was applied to additional blocks to reflect locations where a more aggressive mode split might be pursued. This aggressive mode split could be the result of residents making a personal choice about transit usage or employees, encouraged by employer sponsored programs finding other ways to work rather than personal auto.

The foregoing assumptions are consistent with the developer's and the City's desire to emphasize a multimodal mixed-use site with an aggressive non-auto component of daily travel. General mode split assumptions are included in **Table 5-5.** In accordance with the assumptions of the 2010 Potomac Yard Multimodal Transportation Study, the resulting auto person-trips were assumed to represent the number of vehicle trips (i.e. the analysis assumes a conservative auto occupancy of 1.0).

Table 5-5: Mode Split						
Land Use and Transit Proximity		Transit (Metrorail)	Transit (Metrobus, Dash, Metroway)	Pedestrian and Bicycle (non-auto)	Auto	Total
1	Office adjacent to a transit station	35%	11%	6%	48%	100%
2	Office within ¼ mile of a transit station	21%	9%	6%	64%	100%
3	Residential adjacent to a transit station	54%	1%	16%	29%	100%
4	Residential within ¼ mile of a transit station	48%	1%	15%	36%	100%
5	Residential within ¼ to ½ mile of Transit	31%	5%	10%	54%	100%
6	Hotel	27%	4%	31%	38%	100%
7	Retail and Restaurant (excluding large format retail)	29%	8%	27%	36%	100%

5.5 INTERNAL CAPTURE

Based on the City-approved mode choice assumptions described above, it was determined that the internal capture of trips between land uses would be represented by the pedestrian and bicycle mode split percentages. In order to avoid double counting of internally captured trips, no other internal capture factors were applied to the site trip generation. This is consistent with the methodology of the 2010 Potomac Yard Multimodal Transportation Study and the Oakville Triangle Multimodal Transportation Study.

5.6 PASS-BY

Pass-by represents those trips that are not new to the network, but instead vehicles that would have already been traveling along the study area streets that will be attracted to the site during their primary trip. For the Updated Plan, a pass-by factor of 43 percent was applied to the PM peak hour trips for the restaurant land uses and a pass-by factor of 36 percent was applied to the PM peak hour trips for the anchor retail land uses. These pass-by factors are consistent with the average pass-by factors for the high-turnover sit down restaurant and for the shopping center land uses, respectively, as contained in the ITE Trip Generation Handbook.

Pass-by factors were not applied to specialty retail or to other land uses in this study. It is noted, that no pass-by factors were applied to the 2010 Plan trip generation due to the generalized land use assumptions of that plan.

5.7 SITE TRIP GENERATION BY MODE OF TRAVEL

This section describes the calculation of site generated trips by mode of travel for both the 2010 Plan and for the Updated Plan.

2010 Plan Trip Generation by Mode

The resulting trip generation by mode for the 2010 Plan is presented in **Table 5-6** for Phase I and **Table 5-7** for full build-out.

Table 5-6: Phase I Trip Generation by Mode (2010 Plan)

LAND USE		AM TOTAL	AM IN	AM OUT	PM TOTAL	PM IN	PM OUT	Daily
Retail	50,000 SF	35	15	20	141	62	79	2,177
Transit (Metrorail - 29%)		10	5	5	41	18	23	631
Transit (Metrobus, Dash, Metroway - 8%)		3	1	2	11	5	6	174
Pedestrian & Bicycle (27%)		9	4	5	38	17	21	588
Auto (36%)		13	5	8	51	22	29	784
Townhouse	489 DUs	187	58	129	224	130	94	1,913
Transit (Metrorail - 31%)		58	18	40	70	40	30	593
Transit (Metrobus, Dash, Metroway - 5%)		9	3	6	11	7	4	96
Pedestrian & Bicycle (10%)		19	6	13	22	13	9	191
Auto (54%)		101	31	70	121	70	51	1,033
NPY Landbay F (Auto) Total		114	36	78	172	92	80	1,817
Total		**222**	**73**	**149**	**365**	**192**	**173**	**4,090**

Table 5-7: Full Build-Out Trip Generation by Mode (2010 Plan)								
LAND USE		AM TOTAL	AM IN	AM OUT	PM TOTAL	PM IN	PM OUT	Daily
Specialty Retail	670,000 SF	407	179	228	1629	717	912	28,700
Transit (Metrorail - 29%)		118	52	66	472	208	264	8,323
Transit (Metrobus, Dash, Metroway - 8%)		33	14	19	130	57	73	2,296
Pedestrian & Bicycle (27%)		109	49	60	441	194	247	7,749
Auto (36%)		147	64	83	586	258	328	10,332
Retail Shopping Center	170,000 SF	*215*	*133*	*82*	*855*	*410*	*445*	*9,588*
Transit (Metrorail - 29%)		62	39	23	248	119	129	2,781
Transit (Metrobus, Dash, Metroway - 8%)		17	11	6	68	33	35	767
Pedestrian & Bicycle (27%)		59	35	24	231	110	121	2,588
Auto (36%)		77	48	29	308	148	160	3,452
Grocery/supermarket	70,000 SF	*238*	*148*	*92*	*598*	*305*	*293*	*6,078*
Transit (Metrorail - 29%)		69	43	26	173	88	85	1,763
Transit (Metrobus, Dash, Metroway - 8%)		19	12	7	48	24	24	486
Pedestrian & Bicycle (27%)		64	40	24	162	83	79	1,641
Auto (36%)		86	53	33	215	110	105	2,188
Mid-Rise Apartment	4750 DUs	*1,934*	*600*	*1,334*	*2,269*	*1,316*	*953*	*18,581*
Transit (Metrorail - 31%)		600	186	414	703	408	295	5,760
Transit (Metrobus, Dash, Metroway - 5%)		97	30	67	113	66	47	929
Pedestrian & Bicycle (10%)		193	60	133	228	131	97	1,858
Auto (54%)		1,044	324	720	1,225	711	514	10,034
Office	1,475,000 SF	*1,648*	*1.450*	*198*	*1,730*	*294*	*1,436*	*10,150*
Transit (Metrorail - 35%)		577	508	69	606	103	503	3,553
Transit (Metrobus, Dash, Metroway - 11%)		181	160	21	190	32	158	1,117

Table 5-7: Full Build-Out Trip Generation by Mode (2010 Plan)								
LAND USE		AM TOTAL	AM IN	AM OUT	PM TOTAL	PM IN	PM OUT	Daily
Pedestrian & Bicycle (6%)		99	86	13	104	18	86	608
Auto (48%)		791	696	95	830	141	689	4,872
Cinema	90,000 SF	0	0	0	442	274	168	4680
Transit (Metrorail - 26%)		0	0	0	115	71	44	1,217
Transit (Metrobus, Dash, Metroway - 6%)		0	0	0	27	16	11	281
Pedestrian & Bicycle (11%)		0	0	0	48	31	17	514
Auto (57%)		0	0	0	252	156	96	2,668
Hotel	300 Rooms	144	96	48	165	69	96	1872
Transit (Metrorail - 27%)		39	26	13	45	19	26	505
Transit (Metrobus, Dash, Metroway - 4%)		6	4	2	7	3	4	75
Pedestrian & Bicycle (31%)		44	30	14	50	21	29	581
Auto (38%)		55	36	19	63	26	37	711
NPY Landbay F (Auto) Total		2,200	1,221	979	3,479	1,550	1,929	34,257
Total		**4,586**	**2,606**	**1,982**	**7,688**	**3,385**	**4,303**	**79,649**

Updated Plan Trip Generation by Mode

The resulting trip generation by mode for the Updated Plan is presented in **Table 5-8** for Phase I and **Table 5-9** for full build-out. The calculated person trips for each land use type in the development were proportionately distributed to each block based on the density of the land use on each specific block. The person trips were then broken down into the various modes of travel.

Table 5-8: Phase I Trip Generation by Mode (Updated Plan)

Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Block 7 Retail - Anchor	28	17	45	80	87	167	1,905
Transit (Metrorail - 29%)	8	5	13	23	25	48	552
Transit (Metrobus, Dash, Metroway - 8%)	2	2	4	6	7	13	152
Pedestrian & Bicycle (27%)	7	5	12	22	23	45	514
Auto (36%)	11	5	16	29	32	61	687
Pass-By (36% of Auto)				-11	-11	-22	
Block 7 Retail - Inline	2	1	3	6	7	13	198
Transit (Metrorail - 29%)	1	0	1	2	2	4	57
Transit (Metrobus, Dash, Metroway - 8%)	0	0	0	0	1	1	16
Pedestrian & Bicycle (27%)	1	0	1	2	2	4	53
Auto (36%)	0	1	1	2	2	4	72
Block 7 Restaurant	18	15	33	18	12	30	387
Transit (Metrorail - 29%)	6	4	10	5	4	9	112
Transit (Metrobus, Dash, Metroway - 8%)	2	1	3	1	1	2	31
Pedestrian & Bicycle (27%)	5	4	9	5	3	8	104
Auto (36%)	5	6	11	7	4	11	140
Pass-By (43% of Auto)				-3	-3	-6	
Block 7 Residential	28	63	91	63	45	108	908
Transit (Metrorail - 54%)	15	34	49	34	24	58	490
Transit (Metrobus, Dash, Metroway - 1%)	0	1	1	1	0	1	9
Pedestrian & Bicycle (16%)	5	10	15	10	7	17	145
Auto (29%)	8	18	26	18	14	32	264
Block 7 Total Auto	24	30	54	42	38	80	1,163
Block 8 Retail - Inline	5	3	8	14	18	32	504
Transit (Metrorail - 29%)	1	1	2	4	5	9	146
Transit (Metrobus, Dash, Metroway - 8%)	1	0	1	1	2	3	40
Pedestrian & Bicycle (27%)	1	1	2	4	5	9	136
Auto (36%)	2	1	3	5	6	11	182
Block 10/14 Retail - Anchor	7	5	12	25	28	53	578
Transit (Metrorail - 29%)	17	11	28	46	58	104	1,191
Transit (Metrobus, Dash, Metroway - 8%)	5	3	8	14	16	30	345
Pedestrian & Bicycle (27%)	1	1	2	4	4	8	95
Auto (36%)	5	3	8	13	15	28	322

Table 5-8: Phase I Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Pass-By (36% of Auto)				-7	-7	-14	
Block 10/14 Retail - Inline	6	3	9	15	20	35	546
Transit (Metrorail - 29%)	2	1	3	4	6	10	158
Transit (Metrobus, Dash, Metroway - 8%)	1	0	1	1	2	3	44
Pedestrian & Bicycle (27%)	1	1	2	4	5	9	147
Auto (36%)	2	1	3	6	7	13	197
Block 10/14 Restaurant	50	41	91	50	33	83	1,065
Transit (Metrorail - 29%)	14	12	26	14	10	24	309
Transit (Metrobus, Dash, Metroway - 8%)	4	3	7	4	3	7	85
Pedestrian & Bicycle (27%)	14	11	25	13	9	22	288
Auto (36%)	18	15	33	19	11	30	383
Pass-By (43% of Auto)				-7	-7	-14	
Block 10/14 Residential	38	85	123	85	61	146	1,228
Transit (Metrorail - 48%)	18	41	59	41	29	70	589
Transit (Metrobus, Dash, Metroway - 1%)	0	1	1	1	0	1	12
Pedestrian & Bicycle (15%)	6	12	18	13	9	22	184
Auto (36%)	14	31	45	30	23	53	443
Block 10/14 Total Auto	40	51	91	56	50	106	1,452
Block 15 Cinema	-	-	-	137	84	221	4,680
Transit (Metrorail - 26%)	-	-	-	35	22	57	1,217
Transit (Metrobus, Dash, Metroway - 6%)	-	-	-	8	5	13	281
Pedestrian & Bicycle (11%)	-	-	-	15	9	24	515
Auto (57%)	-	-	-	79	48	127	2,667
Block 15 Retail - Anchor	14	8	22	37	46	83	953
Transit (Metrorail - 29%)	4	2	6	12	12	24	276
Transit (Metrobus, Dash, Metroway - 8%)	1	1	2	3	4	7	76
Pedestrian & Bicycle (27%)	4	2	6	11	11	22	257
Auto (36%)	5	3	8	11	19	30	344
Pass-By (36% of Auto)				-6	-6	-12	
Block 15 Retail - Inline	1	1	2	4	6	10	154
Transit (Metrorail - 29%)	1	0	1	1	2	3	45
Transit (Metrobus, Dash, Metroway - 8%)	0	0	0	0	1	1	12
Pedestrian & Bicycle (27%)	0	0	0	1	2	3	42
Auto (36%)	0	1	1	2	1	3	55
Block 15 Restaurant	14	12	26	14	9	23	300
Transit (Metrorail - 29%)	4	4	8	4	3	7	87
Transit (Metrobus, Dash, Metroway - 8%)	1	1	2	1	1	2	24
Pedestrian & Bicycle (27%)	4	3	7	4	2	6	81
Auto (36%)	5	4	9	5	3	8	108

Table 5-8: Phase I Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Pass-By (43% of Auto)				-2	-2	-4	
Block 15 Total Auto	10	8	18	89	63	152	3,174
Block 18 Retail - Inline	6	3	9	15	20	35	555
Transit (Metrorail - 29%)	2	1	3	4	6	10	161
Transit (Metrobus, Dash, Metroway - 8%)	1	0	1	1	2	3	44
Pedestrian & Bicycle (27%)	1	1	2	4	5	9	150
Auto (36%)	2	1	3	6	7	13	200
Block 18 Restaurant	45	36	81	45	29	74	956
Transit (Metrorail - 29%)	13	10	23	13	8	21	277
Transit (Metrobus, Dash, Metroway - 8%)	3	3	6	4	2	6	76
Pedestrian & Bicycle (27%)	12	10	22	12	8	20	258
Auto (36%)	17	13	30	16	11	27	345
Pass-By (43% of Auto)				-6	-6	-12	
Block 18 Residential	23	52	75	52	37	89	747
Transit (Metrorail - 54%)	13	28	41	28	20	48	403
Transit (Metrobus, Dash, Metroway - 1%)	0	1	1	1	0	1	7
Pedestrian & Bicycle (16%)	4	8	12	8	6	14	120
Auto (29%)	6	15	21	15	11	26	217
Block 18 Total Auto	25	29	54	31	23	54	762
Block 19 Gym	71	70	141	201	152	353	3,293
Transit (Metrorail - 29%)	21	20	41	58	44	102	955
Transit (Metrobus, Dash, Metroway - 8%)	6	5	11	16	12	28	263
Pedestrian & Bicycle (27%)	19	19	38	54	41	95	889
Auto (36%)	25	26	51	73	55	128	1,186
Block 19 Retail - Anchor	15	9	24	50	40	90	1,032
Transit (Metrorail - 29%)	4	3	7	12	14	26	299
Transit (Metrobus, Dash, Metroway - 8%)	1	1	2	3	4	7	83
Pedestrian & Bicycle (27%)	4	2	6	12	12	24	279
Auto (36%)	6	3	9	23	10	33	371
Pass-By (36% of Auto)				-6	-6	-12	
Block 19 Retail - Inline	1	1	2	4	4	8	125
Transit (Metrorail - 29%)	1	0	1	1	1	2	36
Transit (Metrobus, Dash, Metroway - 8%)	0	0	0	0	1	1	10
Pedestrian & Bicycle (27%)	0	0	0	1	1	2	34
Auto (36%)	0	1	1	2	1	3	45
Block 19 Restaurant	12	9	21	11	8	19	244
Transit (Metrorail - 29%)	3	3	6	4	2	6	71
Transit (Metrobus, Dash, Metroway - 8%)	1	1	2	1	1	2	20
Pedestrian & Bicycle (27%)	3	3	6	3	2	5	66

Table 5-8: Phase I Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Auto (36%)	5	2	7	3	3	6	87
Pass-By (43% of Auto)				-2	-2	-4	
Block 19 Total Auto	36	32	68	93	61	154	1,689
Block 20 Retail - Inline	5	4	9	15	19	34	541
Transit (Metrorail - 29%)	2	1	3	4	6	10	157
Transit (Metrobus, Dash, Metroway - 8%)	1	0	1	1	2	3	43
Pedestrian & Bicycle (27%)	1	1	2	4	5	9	146
Auto (36%)	1	2	3	6	6	12	195
Block 20 Restaurant	35	29	64	35	24	59	763
Transit (Metrorail - 29%)	10	9	19	10	7	17	221
Transit (Metrobus, Dash, Metroway - 8%)	3	2	5	3	2	5	61
Pedestrian & Bicycle (27%)	9	8	17	10	6	16	206
Auto (36%)	13	10	23	12	9	21	275
Pass-By (43% of Auto)				-5	-5	-10	
Block 20 Office	222	30	252	40	197	237	1,708
Transit (Metrorail – 35%)	77	11	88	14	69	83	598
Transit (Metrobus, Dash, Metroway - 11%)	25	3	28	4	22	26	188
Pedestrian & Bicycle (6%)	13	2	15	2	12	14	102
Transit (Metrorail – 35%)	107	14	121	20	94	114	820
Block 20 Hotel	48	24	72	34	48	82	936
Transit (Metrorail - 27%)	13	6	19	9	13	22	253
Transit (Metrobus, Dash, Metroway - 4%)	2	1	3	1	2	3	37
Pedestrian & Bicycle (31%)	15	7	22	11	14	25	290
Auto (38%)	18	10	28	13	19	32	356
Block 20 Total Auto	139	36	175	47	122	169	1,646
Transit – Metrorail Total	238	199	437	350	350	700	7,814
Transit – Metrobus, Dash, Metroway Total	56	28	84	66	81	147	1,709
Pedestrian & Bicycle Total	134	113	247	238	215	453	5,328
Auto Total	276	187	463	418	418	836	10,068
Pass-by Auto Total				-55	-55	-110	
Net Auto Total	276	187	463	363	363	726	10,068
Total Trips	**704**	**527**	**1,231**	**1,072**	**1,064**	**2,136**	**24,919**

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Block 2 Residential	64	143	207	141	102	243	1,991
Transit (Metrorail - 31%)	*20*	*44*	*64*	*44*	*31*	*75*	*617*
Transit (Metrobus, Dash, Metroway - 5%)	*3*	*7*	*10*	*7*	*5*	*12*	*100*
Pedestrian & Bicycle (10%)	*7*	*14*	*21*	*14*	*10*	*24*	*199*
Auto (54%)	*34*	*78*	*112*	*76*	*56*	*132*	*1,075*
Block 2 Total Auto	**34**	**78**	**112**	**76**	**56**	**132**	**1,075**
Block 3 Retail - Inline	1	0	1	1	2	3	43
Transit (Metrorail - 29%)	*0*	*0*	*0*	*0*	*1*	*1*	*12*
Transit (Metrobus, Dash, Metroway - 8%)	*0*	*0*	*0*	*0*	*0*	*0*	*3*
Pedestrian & Bicycle (27%)	*0*	*0*	*0*	*0*	*1*	*1*	*12*
Auto (36%)	*1*	*0*	*1*	*1*	*0*	*1*	*16*
Block 3 Restaurant	24	19	43	23	16	39	509
Transit (Metrorail - 29%)	*7*	*5*	*12*	*7*	*4*	*11*	*148*
Transit (Metrobus, Dash, Metroway - 8%)	*2*	*1*	*3*	*2*	*1*	*3*	*41*
Pedestrian & Bicycle (27%)	*7*	*5*	*12*	*7*	*4*	*11*	*137*
Auto (36%)	*8*	*8*	*16*	*7*	*7*	*14*	*183*
Pass-By (43% of Auto)				*-3*	*-3*	*-6*	
Block 3 Hotel	48	24	72	35	48	83	936
Transit (Metrorail – 27%)	*13*	*6*	*19*	*9*	*13*	*22*	*253*
Transit (Metrobus, Dash, Metroway - 4%)	*2*	*1*	*3*	*1*	*2*	*3*	*37*
Pedestrian & Bicycle (31%)	*15*	*7*	*22*	*11*	*15*	*26*	*290*
Auto (38%)	*18*	*10*	*28*	*14*	*18*	*32*	*356*
Block 3 Total Auto	**27**	**18**	**45**	**19**	**22**	**41**	**555**
Block 5 Residential	78	175	253	172	125	297	2441
Transit (Metrorail – 31%)	*24*	*54*	*78*	*53*	*39*	*92*	*757*
Transit (Metrobus, Dash, Metroway - 5%)	*4*	*9*	*13*	*9*	*6*	*15*	*122*
Pedestrian & Bicycle (10%)	*8*	*17*	*25*	*17*	*13*	*30*	*244*
Auto (54%)	*42*	*95*	*137*	*93*	*67*	*160*	*1,318*
Block 5 Total Auto	**42**	**95**	**137**	**93**	**67**	**160**	**1,318**
Block 6 Residential	56	126	182	124	90	214	1,752
Transit (Metrorail – 31%)	*17*	*39*	*56*	*38*	*28*	*66*	*543*
Transit (Metrobus, Dash, Metroway - 5%)	*3*	*6*	*9*	*6*	*5*	*11*	*88*
Pedestrian & Bicycle (10%)	*6*	*12*	*18*	*12*	*9*	*21*	*175*
Auto (54%)	*30*	*69*	*99*	*68*	*48*	*116*	*946*
Block 6 Total Auto	**30**	**69**	**99**	**68**	**48**	**116**	**946**
Block 7 Retail - Anchor	12	8	20	40	44	84	925
Transit (Metrorail - 29%)	*4*	*2*	*6*	*12*	*12*	*24*	*268*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*1*	*2*	*3*	*4*	*7*	*74*
Pedestrian & Bicycle (27%)	*3*	*2*	*5*	*11*	*12*	*23*	*250*

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Auto (36%)	*4*	*3*	*7*	*14*	*16*	*30*	*333*
Pass-By (36% of Auto)				*-6*	*-6*	*-12*	
Block 7 Retail - Inline	2	1	3	5	7	12	196
Transit (Metrorail - 29%)	*1*	*0*	*1*	*1*	*2*	*3*	*57*
Transit (Metrobus, Dash, Metroway - 8%)	*0*	*0*	*0*	*0*	*1*	*1*	*16*
Pedestrian & Bicycle (27%)	*1*	*0*	*1*	*1*	*2*	*3*	*53*
Auto (36%)	*0*	*1*	*1*	*3*	*2*	*5*	*70*
Block 7 Restaurant	18	15	33	18	12	30	387
Transit (Metrorail - 29%)	*6*	*4*	*10*	*5*	*4*	*9*	*112*
Transit (Metrobus, Dash, Metroway - 8%)	*2*	*1*	*3*	*1*	*1*	*2*	*31*
Pedestrian & Bicycle (27%)	*5*	*4*	*9*	*5*	*3*	*8*	*104*
Auto (36%)	*5*	*6*	*11*	*7*	*4*	*11*	*140*
Pass-By (43% of Auto)				*-2*	*-2*	*-4*	
Block 7 Residential	29	65	94	64	47	111	908
Transit (Metrorail - 54%)	*16*	*35*	*51*	*35*	*25*	*60*	*490*
Transit (Metrobus, Dash, Metroway - 1%)	*0*	*1*	*1*	*1*	*0*	*1*	*9*
Pedestrian & Bicycle (16%)	*5*	*10*	*15*	*10*	*8*	*18*	*145*
Auto (29%)	*8*	*19*	*27*	*18*	*14*	*32*	*264*
Block 7 Total Auto	**17**	**29**	**46**	**34**	**28**	**62**	**807**
Block 8 Retail - Anchor	22	13	35	71	77	148	1,626
Transit (Metrorail - 29%)	*6*	*4*	*10*	*21*	*22*	*43*	*472*
Transit (Metrobus, Dash, Metroway - 8%)	*2*	*1*	*3*	*6*	*6*	*12*	*130*
Pedestrian & Bicycle (27%)	*6*	*3*	*9*	*19*	*21*	*40*	*439*
Auto (36%)	*8*	*5*	*13*	*25*	*28*	*53*	*585*
Pass-By (36% of Auto)				*-10*	*-10*	*-20*	
Block 8 Retail - Inline	4	2	6	11	13	24	408
Transit (Metrorail - 29%)	*1*	*1*	*2*	*3*	*4*	*7*	*118*
Transit (Metrobus, Dash, Metroway - 8%)	*0*	*0*	*0*	*1*	*1*	*2*	*33*
Pedestrian & Bicycle (27%)	*1*	*1*	*2*	*3*	*3*	*6*	*110*
Auto (36%)	*2*	*0*	*2*	*4*	*5*	*9*	*147*
Block 8 Restaurant	37	31	68	37	25	62	804
Transit (Metrorail - 29%)	*11*	*9*	*20*	*11*	*7*	*18*	*233*
Transit (Metrobus, Dash, Metroway - 8%)	*3*	*2*	*5*	*3*	*2*	*5*	*64*
Pedestrian & Bicycle (27%)	*10*	*8*	*18*	*10*	*7*	*17*	*217*
Auto (36%)	*13*	*12*	*25*	*13*	*9*	*22*	*290*
Pass-By (43% of Auto)				*-5*	*-5*	*-10*	
Block 8 Residential	63	141	204	139	101	240	1,968
Transit (Metrorail - 54%)	*34*	*76*	*110*	*75*	*55*	*130*	*1,063*
Transit (Metrobus, Dash, Metroway - 1%)	*1*	*1*	*2*	*1*	*1*	*2*	*20*

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Pedestrian & Bicycle (16%)	*10*	*23*	*33*	*22*	*16*	*38*	*315*
Auto (29%)	*18*	*41*	*59*	*41*	*29*	*70*	*570*
Block 8 Total Auto	**41**	**58**	**99**	**68**	**56**	**124**	**1,592**
Block 9 Retail - Anchor	24	15	39	79	86	165	1,807
Transit (Metrorail - 29%)	*7*	*4*	*11*	*23*	*25*	*48*	*524*
Transit (Metrobus, Dash, Metroway - 8%)	*2*	*1*	*3*	*6*	*7*	*13*	*145*
Pedestrian & Bicycle (27%)	*7*	*4*	*11*	*22*	*23*	*45*	*488*
Auto (36%)	*8*	*6*	*14*	*28*	*31*	*59*	*650*
Pass-By (36% of Auto)				*-11*	*-11*	*-22*	
Block 9 Retail - Inline	4	2	6	11	13	24	415
Transit (Metrorail - 29%)	*1*	*1*	*2*	*3*	*4*	*7*	*120*
Transit (Metrobus, Dash, Metroway - 8%)	*0*	*0*	*0*	*1*	*1*	*2*	*33*
Pedestrian & Bicycle (27%)	*1*	*1*	*2*	*3*	*3*	*6*	*112*
Auto (36%)	*2*	*0*	*2*	*4*	*5*	*9*	*150*
Block 9 Restaurant	39	31	70	38	25	63	819
Transit (Metrorail - 29%)	*11*	*9*	*20*	*11*	*7*	*18*	*238*
Transit (Metrobus, Dash, Metroway - 8%)	*3*	*3*	*6*	*3*	*2*	*5*	*66*
Pedestrian & Bicycle (27%)	*10*	*9*	*19*	*10*	*7*	*17*	*221*
Auto (36%)	*15*	*10*	*25*	*14*	*9*	*23*	*294*
Pass-By (43% of Auto)				*-5*	*-5*	*-10*	
Block 9 Residential	36	79	115	78	57	135	1,111
Transit (Metrorail - 48%)	*17*	*38*	*55*	*38*	*27*	*65*	*533*
Transit (Metrobus, Dash, Metroway - 1%)	*0*	*1*	*1*	*1*	*0*	*1*	*11*
Pedestrian & Bicycle (15%)	*5*	*12*	*17*	*12*	*8*	*20*	*167*
Auto (36%)	*14*	*28*	*42*	*27*	*22*	*49*	*400*
Block 9 Total Auto	**39**	**44**	**83**	**57**	**51**	**108**	**1,494**
Block 10/14 Retail - Anchor	7	5	12	25	28	53	578
Transit (Metrorail - 29%)	*2*	*1*	*3*	*7*	*8*	*15*	*168*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*2*	*2*	*4*	*46*
Pedestrian & Bicycle (27%)	*2*	*1*	*3*	*7*	*7*	*14*	*156*
Auto (36%)	*2*	*3*	*5*	*9*	*11*	*20*	*208*
Pass-By (36% of Auto)				*-4*	*-4*	*-8*	
Block 10/14 Retail - Inline	5	3	8	14	18	32	541
Transit (Metrorail - 29%)	*1*	*1*	*2*	*4*	*5*	*9*	*157*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*1*	*2*	*3*	*43*
Pedestrian & Bicycle (27%)	*1*	*1*	*2*	*4*	*5*	*9*	*146*
Auto (36%)	*2*	*1*	*3*	*5*	*6*	*11*	*195*
Block 10/14 Restaurant	50	41	91	50	33	83	1,066
Transit (Metrorail - 29%)	*14*	*12*	*26*	*14*	*10*	*24*	*309*

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Transit (Metrobus, Dash, Metroway - 8%)	*4*	*3*	*7*	*4*	*3*	*7*	*85*
Pedestrian & Bicycle (27%)	*14*	*11*	*25*	*13*	*9*	*22*	*288*
Auto (36%)	*18*	*15*	*33*	*19*	*11*	*30*	*384*
Pass-By (43% of Auto)				*-7*	*-7*	*-14*	
Block 10/14 Residential	40	88	128	87	63	150	1228
Transit (Metrorail - 48%)	*19*	*42*	*61*	*42*	*30*	*72*	*589*
Transit (Metrobus, Dash, Metroway - 1%)	*0*	*1*	*1*	*1*	*1*	*2*	*12*
Pedestrian & Bicycle (15%)	*6*	*13*	*19*	*13*	*10*	*23*	*184*
Auto (36%)	*15*	*32*	*47*	*31*	*22*	*53*	*443*
Block 10/14 Total Auto	**37**	**51**	**88**	**53**	**39**	**92**	**1,230**
Block 11 Office	521	71	592	118	576	694	3,553
Transit (Metrorail – 35%)	*182*	*25*	*207*	*41*	*202*	*243*	*1,244*
Transit (Metrobus, Dash, Metroway - 11%)	*57*	*8*	*65*	*13*	*63*	*76*	*391*
Pedestrian & Bicycle (6%)	*32*	*4*	*36*	*7*	*35*	*42*	*213*
Auto – (48%)	*250*	*34*	*284*	*57*	*276*	*333*	*1,705*
Block 11 Retail - Anchor	23	14	37	75	82	157	1,726
Transit (Metrorail - 29%)	*7*	*4*	*11*	*22*	*24*	*46*	*501*
Transit (Metrobus, Dash, Metroway - 8%)	*2*	*1*	*3*	*6*	*7*	*13*	*138*
Pedestrian & Bicycle (27%)	*6*	*4*	*10*	*20*	*22*	*42*	*466*
Auto (36%)	*8*	*5*	*13*	*27*	*29*	*56*	*621*
Pass-By (36% of Auto)				*-10*	*-10*	*-20*	
Block 11 Retail - Inline	7	4	11	20	26	46	779
Transit (Metrorail - 29%)	*2*	*1*	*3*	*6*	*7*	*13*	*226*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*2*	*2*	*4*	*62*
Pedestrian & Bicycle (27%)	*2*	*1*	*3*	*5*	*7*	*12*	*210*
Auto (36%)	*2*	*2*	*4*	*7*	*10*	*17*	*281*
Block 11 Restaurant	72	59	131	71	48	119	1,536
Transit (Metrorail - 29%)	*21*	*17*	*38*	*21*	*14*	*35*	*445*
Transit (Metrobus, Dash, Metroway - 8%)	*6*	*4*	*10*	*6*	*4*	*10*	*123*
Pedestrian & Bicycle (27%)	*19*	*16*	*35*	*19*	*13*	*32*	*415*
Auto (36%)	*26*	*22*	*48*	*25*	*17*	*42*	*553*
Pass-By (43% of Auto)				*-9*	*-9*	*-18*	
Block 11 Total Auto	**286**	**63**	**349**	**97**	**313**	**410**	**3,160**
Block 12 Retail - Anchor	66	40	106	216	233	449	4,933
Transit (Metrorail - 29%)	*19*	*12*	*31*	*62*	*68*	*130*	*1,431*
Transit (Metrobus, Dash, Metroway - 8%)	*5*	*3*	*8*	*17*	*19*	*36*	*395*
Pedestrian & Bicycle (27%)	*18*	*11*	*29*	*58*	*63*	*121*	*1,332*
Auto (36%)	*24*	*14*	*38*	*79*	*83*	*162*	*1,775*

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Pass-By (36% of Auto)				*-29*	*-29*	*-58*	
Block 12 Retail - Inline	7	4	11	19	24	43	723
Transit (Metrorail - 29%)	*2*	*1*	*3*	*5*	*7*	*12*	*210*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*1*	*2*	*3*	*58*
Pedestrian & Bicycle (27%)	*2*	*1*	*3*	*5*	*7*	*12*	*195*
Auto (36%)	*2*	*2*	*4*	*8*	*8*	*16*	*260*
Block 12 Restaurant	67	54	121	66	44	110	1,424
Transit (Metrorail - 29%)	*19*	*16*	*35*	*19*	*13*	*32*	*413*
Transit (Metrobus, Dash, Metroway - 8%)	*6*	*4*	*10*	*5*	*4*	*9*	*114*
Pedestrian & Bicycle (27%)	*18*	*15*	*33*	*18*	*12*	*30*	*384*
Auto (36%)	*24*	*19*	*43*	*24*	*15*	*39*	*513*
Pass-By (43% of Auto)				*-9*	*-9*	*-18*	
Block 12 Residential	33	73	106	72	52	124	1,017
Transit (Metrorail - 48%)	*16*	*35*	*51*	*35*	*25*	*60*	*488*
Transit (Metrobus, Dash, Metroway - 1%)	*0*	*1*	*1*	*1*	*0*	*1*	*10*
Pedestrian & Bicycle (15%)	*5*	*11*	*16*	*11*	*8*	*19*	*153*
Auto (36%)	*12*	*26*	*38*	*25*	*19*	*44*	*366*
Block 12 Total Auto	**62**	**61**	**123**	**98**	**87**	**185**	**2,914**
Block 15 Cinema	-	-	-	137	84	221	4,680
Transit (Metrorail - 26%)	-	-	-	*35*	*22*	*57*	*1,217*
Transit (Metrobus, Dash, Metroway - 6%)	-	-	-	*8*	*5*	*13*	*281*
Pedestrian & Bicycle (11%)	-	-	-	*15*	*9*	*24*	*515*
Auto (057%)	-	-	-	*79*	*48*	*127*	*2,667*
Block 15 Retail - Anchor	6	4	10	20	22	42	462
Transit (Metrorail - 29%)	*2*	*1*	*3*	*6*	*6*	*12*	*134*
Transit (Metrobus, Dash, Metroway - 8%)	*0*	*1*	*1*	*1*	*2*	*3*	*37*
Pedestrian & Bicycle (27%)	*2*	*1*	*3*	*5*	*6*	*11*	*125*
Auto (36%)	*2*	*1*	*3*	*8*	*8*	*16*	*166*
Pass-By (36% of Auto)				*3*	*3*	*6*	
Block 15 Retail - Inline	1	1	2	4	5	9	152
Transit (Metrorail - 29%)	*1*	*0*	*1*	*1*	*2*	*3*	*44*
Transit (Metrobus, Dash, Metroway - 8%)	*0*	*0*	*0*	*0*	*1*	*1*	*12*
Pedestrian & Bicycle (27%)	*0*	*0*	*0*	*1*	*1*	*2*	*41*
Auto (36%)	*0*	*1*	*1*	*2*	*1*	*3*	*55*
Block 15 Restaurant	14	12	26	14	9	23	300
Transit (Metrorail - 29%)	*4*	*4*	*8*	*4*	*3*	*7*	*87*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*1*	*2*	*1*	*1*	*2*	*24*
Pedestrian & Bicycle (27%)	*4*	*3*	*7*	*4*	*2*	*6*	*81*
Auto (36%)	*5*	*4*	*9*	*5*	*3*	*8*	*108*

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Pass-By (43% of Auto)				*-2*	*-2*	*-4*	
Block 15 Total Auto	**7**	**6**	**13**	**89**	**55**	**144**	**2,996**
Block 16 Office	495	67	562	112	547	659	3,373
Transit (Metrorail – 35%)	*173*	*24*	*197*	*39*	*192*	*231*	*1,181*
Transit (Metrobus, Dash, Metroway - 11%)	*55*	*7*	*62*	*12*	*60*	*72*	*371*
Pedestrian & Bicycle (6%)	*30*	*4*	*34*	*7*	*33*	*40*	*202*
Auto – (48%)	*237*	*32*	*269*	*54*	*262*	*316*	*1,619*
Block 16 Retail - Inline	5	3	8	13	17	30	511
Transit (Metrorail - 29%)	*1*	*1*	*2*	*4*	*5*	*9*	*148*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*1*	*1*	*2*	*41*
Pedestrian & Bicycle (27%)	*1*	*1*	*2*	*4*	*4*	*8*	*138*
Auto (36%)	*2*	*1*	*3*	*4*	*7*	*11*	*184*
Block 16 Restaurant	47	39	86	47	31	78	1,007
Transit (Metrorail - 29%)	*14*	*11*	*25*	*14*	*9*	*23*	*292*
Transit (Metrobus, Dash, Metroway - 8%)	*4*	*3*	*7*	*4*	*2*	*6*	*81*
Pedestrian & Bicycle (27%)	*13*	*10*	*23*	*13*	*8*	*21*	*272*
Auto (36%)	*16*	*15*	*31*	*16*	*12*	*28*	*362*
Pass-By (43% of Auto)				*-6*	*-6*	*-12*	
Block 16 Total Auto	**255**	**48**	**303**	**68**	**275**	**343**	**2,165**
Block 17 Office	297	40	337	67	328	395	2,022
Transit (Metrorail – 35%)	*104*	*14*	*118*	*23*	*115*	*138*	*708*
Transit (Metrobus, Dash, Metroway - 11%)	*33*	*4*	*37*	*7*	*36*	*43*	*222*
Pedestrian & Bicycle (6%)	*18*	*2*	*20*	*4*	*20*	*24*	*121*
Auto – (48%)	*142*	*20*	*162*	*33*	*157*	*190*	*971*
Block 17 Retail - Inline	4	3	7	12	16	28	475
Transit (Metrorail - 29%)	*1*	*1*	*2*	*4*	*4*	*8*	*138*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*1*	*1*	*2*	*38*
Pedestrian & Bicycle (27%)	*1*	*1*	*2*	*4*	*4*	*8*	*128*
Auto (36%)	*1*	*1*	*2*	*3*	*7*	*10*	*171*
Block 17 Restaurant	44	36	80	43	29	72	936
Transit (Metrorail - 29%)	*13*	*10*	*23*	*13*	*8*	*21*	*271*
Transit (Metrobus, Dash, Metroway - 8%)	*3*	*3*	*6*	*4*	*2*	*6*	*75*
Pedestrian & Bicycle (27%)	*12*	*10*	*22*	*11*	*8*	*19*	*253*
Auto (36%)	*16*	*13*	*29*	*15*	*11*	*26*	*337*
Pass-By (43% of Auto)				*-6*	*-6*	*-12*	
Block 17 Total Auto	**159**	**34**	**193**	**45**	**169**	**214**	**1,479**
Block 18 Retail - Inline	5	3	8	14	18	32	550
Transit (Metrorail - 29%)	*1*	*1*	*2*	*4*	*5*	*9*	*160*

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*1*	*2*	*3*	*44*
Pedestrian & Bicycle (27%)	*1*	*1*	*2*	*4*	*5*	*9*	*149*
Auto (36%)	*2*	*1*	*3*	*5*	*6*	*11*	*197*
Block 18 Restaurant	45	36	81	44	30	74	956
Transit (Metrorail - 29%)	*13*	*10*	*23*	*13*	*8*	*21*	*277*
Transit (Metrobus, Dash, Metroway - 8%)	*3*	*3*	*6*	*4*	*2*	*6*	*76*
Pedestrian & Bicycle (27%)	*12*	*10*	*22*	*12*	*8*	*20*	*258*
Auto (36%)	*17*	*13*	*30*	*15*	*12*	*27*	*345*
Pass-By (43% of Auto)				*-6*	*-6*	*-12*	
Block 18 Residential	25	53	78	53	37	90	747
Transit (Metrorail - 54%)	*13*	*29*	*42*	*28*	*21*	*49*	*403*
Transit (Metrobus, Dash, Metroway - 1%)	*0*	*1*	*1*	*1*	*0*	*1*	*7*
Pedestrian & Bicycle (16%)	*4*	*8*	*12*	*8*	*6*	*14*	*120*
Auto (29%)	*8*	*15*	*23*	*16*	*10*	*26*	*217*
Block 18 Total Auto	**27**	**29**	**56**	**30**	**22**	**52**	**759**
Block 19 Gym	71	70	141	201	152	353	3,293
Transit (Metrorail - 29%)	*21*	*20*	*41*	*58*	*44*	*102*	*955*
Transit (Metrobus, Dash, Metroway - 8%)	*6*	*5*	*11*	*16*	*12*	*28*	*263*
Pedestrian & Bicycle (27%)	*19*	*19*	*38*	*54*	*41*	*95*	*889*
Auto (36%)	*25*	*26*	*51*	*73*	*55*	*128*	*1,186*
Block 19 Retail - Anchor	7	4	11	22	24	46	501
Transit (Metrorail - 29%)	*2*	*1*	*3*	*6*	*7*	*13*	*145*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*2*	*2*	*4*	*40*
Pedestrian & Bicycle (27%)	*2*	*1*	*3*	*6*	*6*	*12*	*135*
Auto (36%)	*2*	*2*	*4*	*8*	*9*	*17*	*181*
Pass-By (36% of Auto)				*-3*	*-3*	*-6*	
Block 19 Retail - Inline	1	1	2	3	4	7	124
Transit (Metrorail - 29%)	*1*	*0*	*1*	*1*	*1*	*2*	*36*
Transit (Metrobus, Dash, Metroway - 8%)	*0*	*0*	*0*	*0*	*1*	*1*	*10*
Pedestrian & Bicycle (27%)	*0*	*0*	*0*	*1*	*1*	*2*	*33*
Auto (36%)	*0*	*1*	*1*	*1*	*1*	*2*	*45*
Block 19 Restaurant	12	9	21	11	8	19	244
Transit (Metrorail - 29%)	*3*	*3*	*6*	*4*	*2*	*6*	*71*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*1*	*2*	*1*	*1*	*2*	*20*
Pedestrian & Bicycle (27%)	*3*	*3*	*6*	*3*	*2*	*5*	*66*
Auto (36%)	*5*	*2*	*7*	*3*	*3*	*6*	*87*
Pass-By (0.43)				*-2*	*-2*	*-4*	
Block 19 Total Auto	**32**	**31**	**63**	**80**	**63**	**143**	**1,499**
Block 20 Retail - Inline	5	3	8	14	18	32	538

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Transit (Metrorail - 29%)	*1*	*1*	*2*	*4*	*5*	*9*	*156*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*1*	*2*	*3*	*43*
Pedestrian & Bicycle (27%)	*1*	*1*	*2*	*4*	*5*	*9*	*145*
Auto (36%)	*2*	*1*	*3*	*5*	*6*	*11*	*194*
Block 20 Restaurant	36	29	65	35	24	59	763
Transit (Metrorail - 29%)	*10*	*9*	*19*	*10*	*7*	*17*	*221*
Transit (Metrobus, Dash, Metroway - 8%)	*3*	*2*	*5*	*3*	*2*	*5*	*61*
Pedestrian & Bicycle (27%)	*10*	*8*	*18*	*10*	*6*	*16*	*206*
Auto (36%)	*13*	*10*	*23*	*12*	*9*	*21*	*275*
Pass-By (43% of Auto)				*-5*	*-5*	*-10*	
Block 20 Office	121	17	138	28	134	162	831
Transit (Metrorail – 35%)	*42*	*6*	*48*	*10*	*47*	*57*	*291*
Transit (Metrobus, Dash, Metroway - 11%)	*13*	*2*	*15*	*3*	*15*	*18*	*91*
Pedestrian & Bicycle (6%)	*7*	*1*	*8*	*2*	*8*	*10*	*50*
Auto – (48%)	*59*	*8*	*67*	*13*	*64*	*77*	*399*
Block 20 Hotel	48	24	72	34	48	82	936
Transit (Metrorail - 27%)	*13*	*6*	*19*	*9*	*13*	*22*	*253*
Transit (Metrobus, Dash, Metroway - 4%)	*2*	*1*	*3*	*1*	*2*	*3*	*37*
Pedestrian & Bicycle (31%)	*15*	*7*	*22*	*11*	*14*	*25*	*290*
Auto (38%)	*18*	*10*	*28*	*13*	*19*	*32*	*356*
Block 20 Total Auto	**92**	**29**	**121**	**38**	**93**	**131**	**1,224**
Block 21 Office	568	77	645	129	627	756	3,869
Transit (Metrorail – 35%)	*199*	*27*	*226*	*45*	*220*	*265*	*1,354*
Transit (Metrobus, Dash, Metroway - 11%)	*62*	*9*	*71*	*14*	*69*	*83*	*426*
Pedestrian & Bicycle (6%)	*34*	*5*	*39*	*8*	*37*	*45*	*232*
Auto (48%)	*273*	*36*	*309*	*62*	*301*	*363*	*1,857*
Block 21 Retail - Inline	8	6	14	25	30	55	939
Transit (Metrorail - 29%)	*2*	*2*	*4*	*7*	*9*	*16*	*272*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*2*	*2*	*4*	*75*
Pedestrian & Bicycle (27%)	*2*	*2*	*4*	*7*	*8*	*15*	*254*
Auto (36%)	*3*	*2*	*5*	*9*	*11*	*20*	*338*
Block 21 Restaurant	86	71	157	86	57	143	1,851
Transit (Metrorail - 29%)	*25*	*21*	*46*	*25*	*16*	*41*	*537*
Transit (Metrobus, Dash, Metroway - 8%)	*7*	*6*	*13*	*7*	*4*	*11*	*148*
Pedestrian & Bicycle (27%)	*23*	*19*	*42*	*23*	*16*	*39*	*500*
Auto (36%)	*31*	*25*	*56*	*31*	*21*	*52*	*666*
Pass-By (43% of Auto)				*-11*	*-11*	*-22*	
Block 21 Total Auto	**307**	**63**	**370**	**91**	**322**	**413**	**2,861**

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Block 22 Office	275	38	313	62	305	367	1,879
Transit (Metrorail – 35%)	*97*	*13*	*110*	*22*	*106*	*128*	*658*
Transit (Metrobus, Dash, Metroway - 11%)	*30*	*4*	*34*	*7*	*33*	*40*	*207*
Pedestrian & Bicycle (6%)	*17*	*2*	*19*	*4*	*18*	*22*	*113*
Auto – (48%)	*131*	*19*	*150*	*29*	*148*	*177*	*901*
Block 22 Retail - Anchor	93	56	149	303	325	628	6,893
Transit (Metrorail - 29%)	*27*	*16*	*43*	*87*	*95*	*182*	*1,999*
Transit (Metrobus, Dash, Metroway - 8%)	*7*	*5*	*12*	*24*	*26*	*50*	*551*
Pedestrian & Bicycle (27%)	*25*	*15*	*40*	*82*	*88*	*170*	*1,861*
Auto (36%)	*34*	*20*	*54*	*110*	*116*	*226*	*2,482*
Pass-By (36% of Auto)				*-41*	*-41*	*-82*	
Block 22 Retail - Inline	4	3	7	12	16	28	471
Transit (Metrorail - 29%)	*1*	*1*	*2*	*4*	*4*	*8*	*137*
Transit (Metrobus, Dash, Metroway - 8%)	*1*	*0*	*1*	*1*	*1*	*2*	*38*
Pedestrian & Bicycle (27%)	*1*	*1*	*2*	*4*	*4*	*8*	*127*
Auto (36%)	*1*	*1*	*2*	*3*	*7*	*10*	*169*
Block 22 Restaurant	63	52	115	63	42	105	1,353
Transit (Metrorail - 29%)	*18*	*15*	*33*	*18*	*12*	*30*	*392*
Transit (Metrobus, Dash, Metroway - 8%)	*5*	*4*	*9*	*5*	*3*	*8*	*108*
Pedestrian & Bicycle (27%)	*17*	*14*	*31*	*17*	*11*	*28*	*365*
Auto (36%)	*23*	*19*	*42*	*23*	*16*	*39*	*488*
Pass-By (43% of Auto)				*-9*	*-9*	*-18*	
Block 22 Total Auto	**189**	**59**	**248**	**115**	**237**	**352**	**4,040**
Block 23 Office	179	25	204	40	198	238	1,220
Transit (Metrorail - 21%)	*38*	*5*	*43*	*9*	*41*	*50*	*256*
Transit (Metrobus, Dash, Metroway - 9%)	*16*	*2*	*18*	*4*	*17*	*21*	*110*
Pedestrian & Bicycle (6%)	*11*	*1*	*12*	*2*	*12*	*14*	*73*
Auto (64%)	*114*	*17*	*131*	*25*	*128*	*153*	*781*
Block 23 Retail - Inline	1	1	2	4	6	10	187
Transit (Metrorail - 29%)	*1*	*0*	*1*	*1*	*2*	*3*	*54*
Transit (Metrobus, Dash, Metroway - 8%)	*0*	*0*	*0*	*0*	*1*	*1*	*15*
Pedestrian & Bicycle (27%)	*0*	*0*	*0*	*1*	*2*	*3*	*50*
Auto (36%)	*0*	*1*	*1*	*2*	*1*	*3*	*68*
Block 23 Restaurant	37	32	69	41	25	66	830
Transit (Metrorail - 29%)	*11*	*9*	*20*	*11*	*8*	*19*	*241*
Transit (Metrobus, Dash, Metroway - 8%)	*3*	*3*	*6*	*3*	*2*	*5*	*66*
Pedestrian & Bicycle (27%)	*10*	*9*	*19*	*11*	*7*	*18*	*224*
Auto (36%)	*13*	*11*	*24*	*16*	*8*	*24*	*299*

Table 5-9: Full Build-Out Trip Generation by Mode (Updated Plan)							
Land Use	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Pass-By (43% of Auto)				*-5*	*-5*	*-10*	
Block 23 Total Auto	**127**	**29**	**156**	**38**	**132**	**170**	**1,148**
Transit – Metrorail Total	1,352	759	2,111	1,186	1,762	2,948	25,827
Transit – Metrobus, Dash, Metroway Total	373	128	501	250	464	714	6,118
Pedestrian & Bicycle Total	527	380	907	711	763	1,474	15,836
Auto Total	1,810	894	2,704	1,466	2,344	3,810	33,262
Pass-by Auto Total	0	0	0	-209	-209	-418	0
Net Auto Total	1,810	894	2,704	1,257	2,135	3,392	33,262
Total Trips	**4,062**	**2,161**	**6,223**	***3,613***	***5,333***	**8,946**	**81,043**

5.8 SITE ACCESS

North Potomac Yard will primarily be accessed from US Route 1, Potomac Avenue, and Main Line Boulevard. The existing intersections of US Route 1 with E. Reed Avenue, Evans Lane, and the Potomac Yard Driveway will serve as signalized intersections and median breaks along US Route 1 that provide direct access to the site.

New unsignalized right-in, right-out streets will be constructed as part of the full build-out to provide additional connectivity to US Route 1. These include Livingston Avenue, Tide Lock Avenue, Silver Meteor Avenue, and Wesmond Drive. Cursory right turn lane warrant analyses were prepared for each of these locations and are included in **Appendix I.** It is noted that the City envisions a more multimodal oriented transportation future; as such they have identified no further widening of US Route 1 for vehicle traffic. Accordingly, while right turn lanes may be warranted at some locations, the turn lanes would be inconsistent with the existing character of US Route 1 and City's goal of minimizing the width of US Route 1 and the required pedestrian crossing distances.

Along Potomac Avenue, six new signalized intersections are proposed to provide access to Potomac Yard. That includes the intersections of Potomac Avenue with Livingston Avenue, Tide Lock Avenue, E. Reed Avenue, Silver Meteor Avenue, Evans Lane, and Wesmond Drive. Cursory traffic signal warrant analyses were prepared for each of these intersections and are included in **Appendix I**. It is noted that the City and the developer are committed to provide a high level of comfort and access for pedestrians through the provision of traffic signals at regular intervals. As such, traffic signals have been included in this study to satisfy some of these more multimodal oriented purposes rather than strictly due to traffic volume warrants.

Main Line Boulevard will be extended from its current terminus at E. Glebe Road. Main Line Boulevard will continue through the redeveloped North Potomac Yard, terminating at Livingston Avenue. The extension of Main Line Boulevard will allow for southern access to and from the redeveloped North Potomac Yard along E. Glebe Road. Phase I and full build-out additional study area intersections are shown on **Figures 5-1** and **Figure 5-2**.

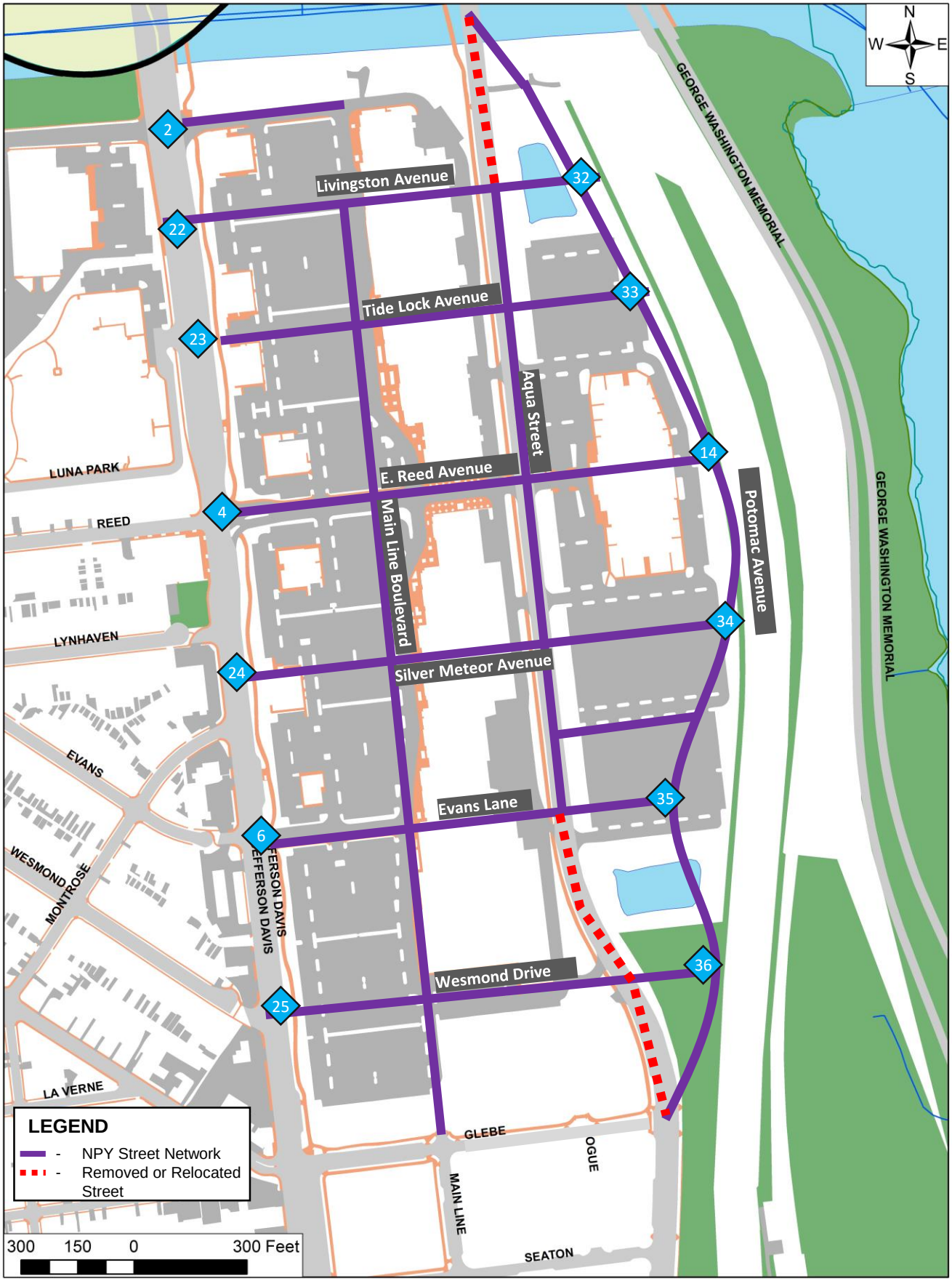


Figure 5-1: North Potomac Yard Study Intersections (2010 Plan)

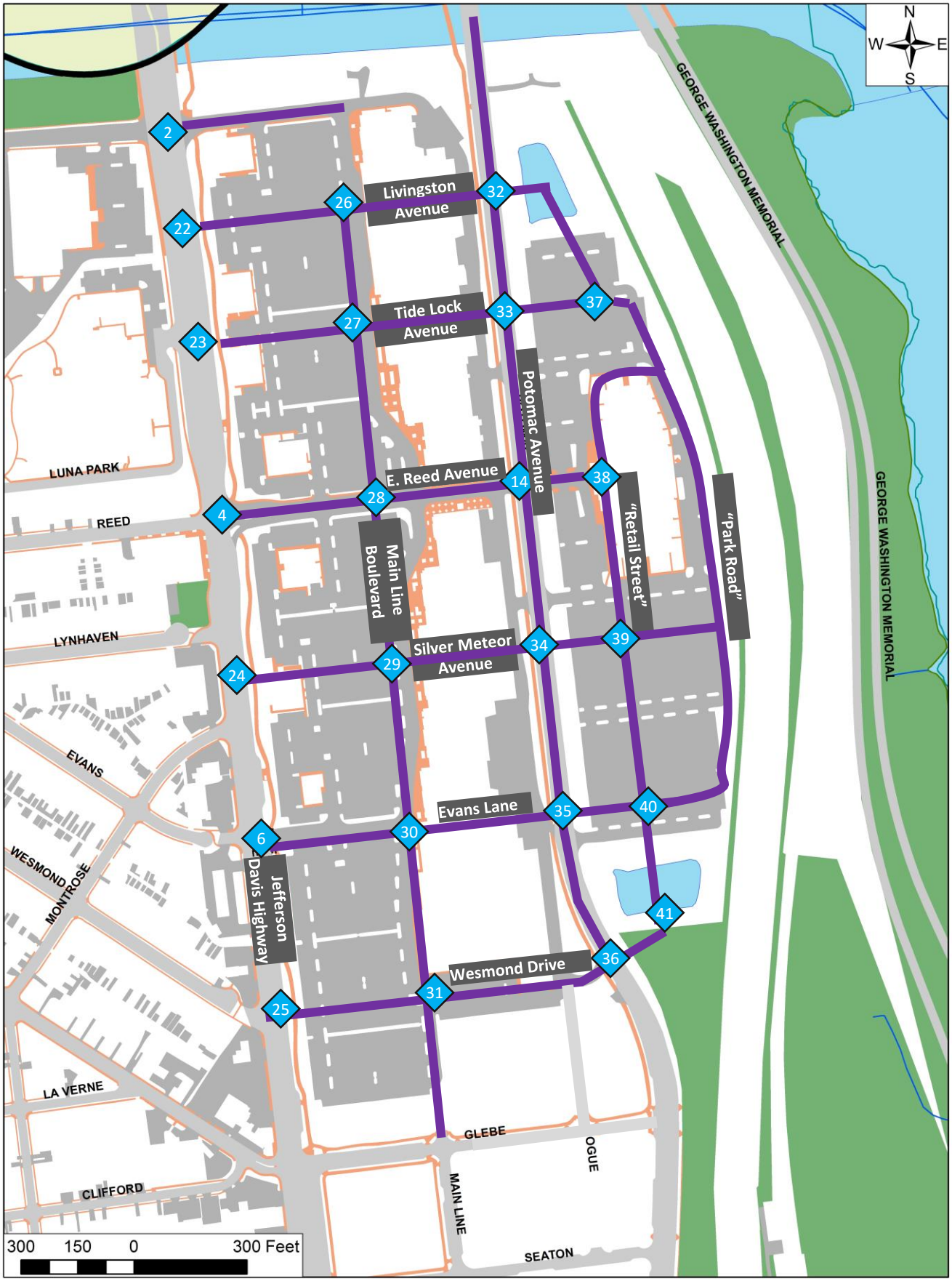


Figure 5-2: North Potomac Yard Study Intersections (Updated Plan)

5.9 TRIP DISTRIBUTION

Vehicle trips were distributed to the study area street network based on the distribution methodology developed for the 2010 Potomac Yard Multimodal Transportation Study and refined as part of the Oakville Triangle Multimodal Transportation Study. The distributions are listed in **Table 5-10** and shown graphically on **Figure 5-3**. These trip distributions were also used for approved and unbuilt development trips.

Table 5-10: Trip Distribution

Direction	Distribution
To/From North on Route 1	26%
To/From Northwest on S. Glebe Road	7%
To/From North on George Washington Memorial Parkway	3%
To/From West on Reed Avenue and E. Glebe Road	10%
To/From West on Custis Avenue and Monroe Avenue	12%
To/From South on Route 1 and Washington Street	30%
To/From North on Potomac Avenue	12%
Total	100%

The trip distributions were further refined to reflect the grid network of neighborhood streets and equally distribute trips among the east-west streets. For example, the 10 percent of trips from/to the west along E. Reed Avenue and E. Glebe Road, was spilt equally (i.e. it was assumed that 5 percent of total trips were to/from E. Glebe Road and 5 percent of total trips were to/from E. Reed Avenue). Similarly, the 12 percent of trips that are to/from the west along Custis Avenue and Monroe Avenue was also split (i.e. it was assumed that 6 percent of total trips were to/from Monroe, 3 percent of total trips were to/from Custis, and 3 percent of total trips were to/from Howell).

5.10 SITE TRIP ASSIGNMENT

The assignment of the North Potomac Yard peak hour traffic volumes to the area roadways is based on the trip distributions described above. Assignment of Phase I site trips for the 2010 Plan is shown on **Figure 5-4.** Assignment of Phase I site trips for the Updated Plan is shown on **Figure 5-5.** Assignment of full build-out site trips for the 2010 Plan is shown on **Figure 5-6.** Assignment of full build-out site trips for the Updated Plan is shown on **Figure 5-7.** Assignment of pass-by and primary site trips are included in **Appendix H**.

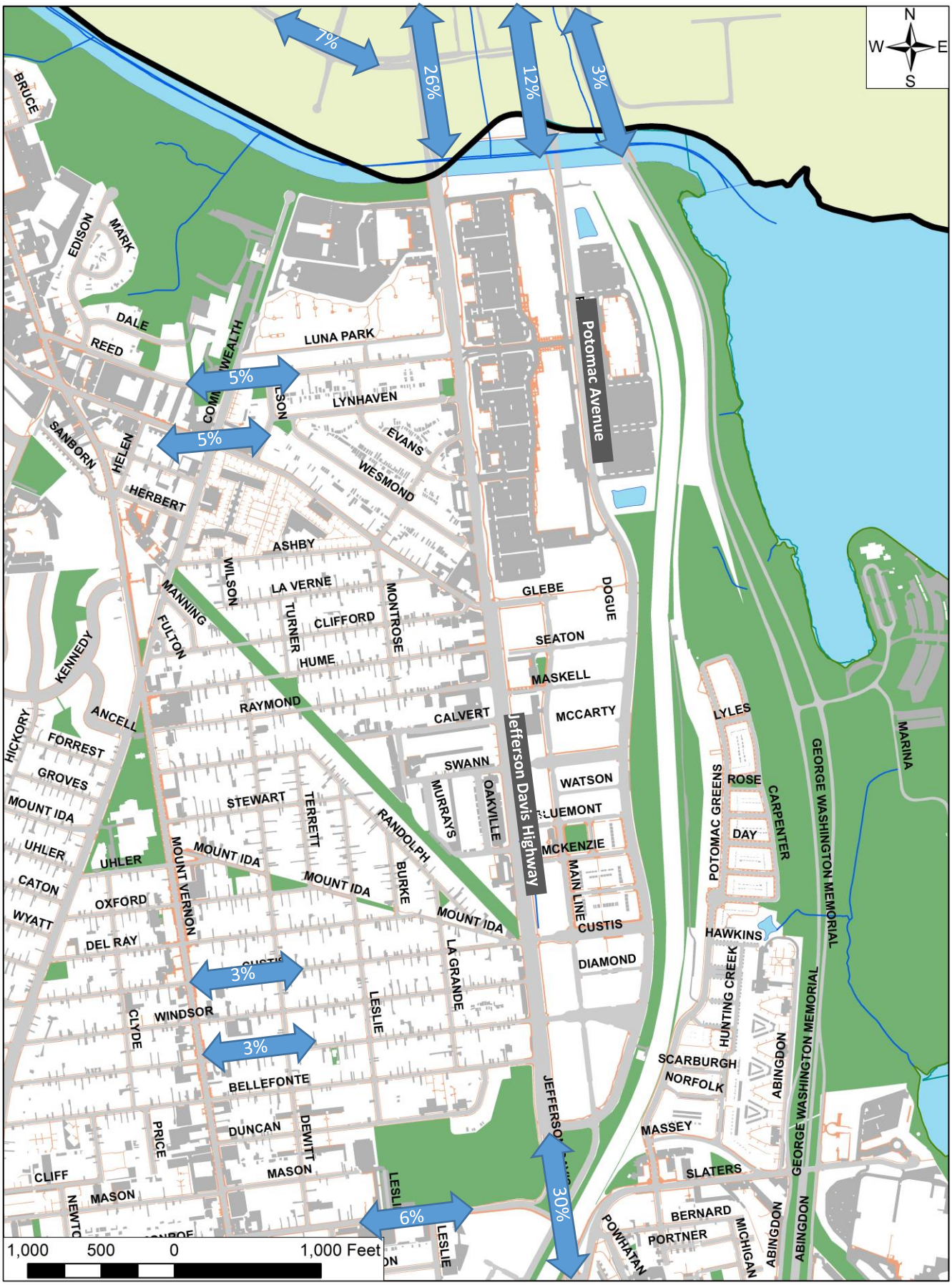


Figure 5-3: Trip Distributions

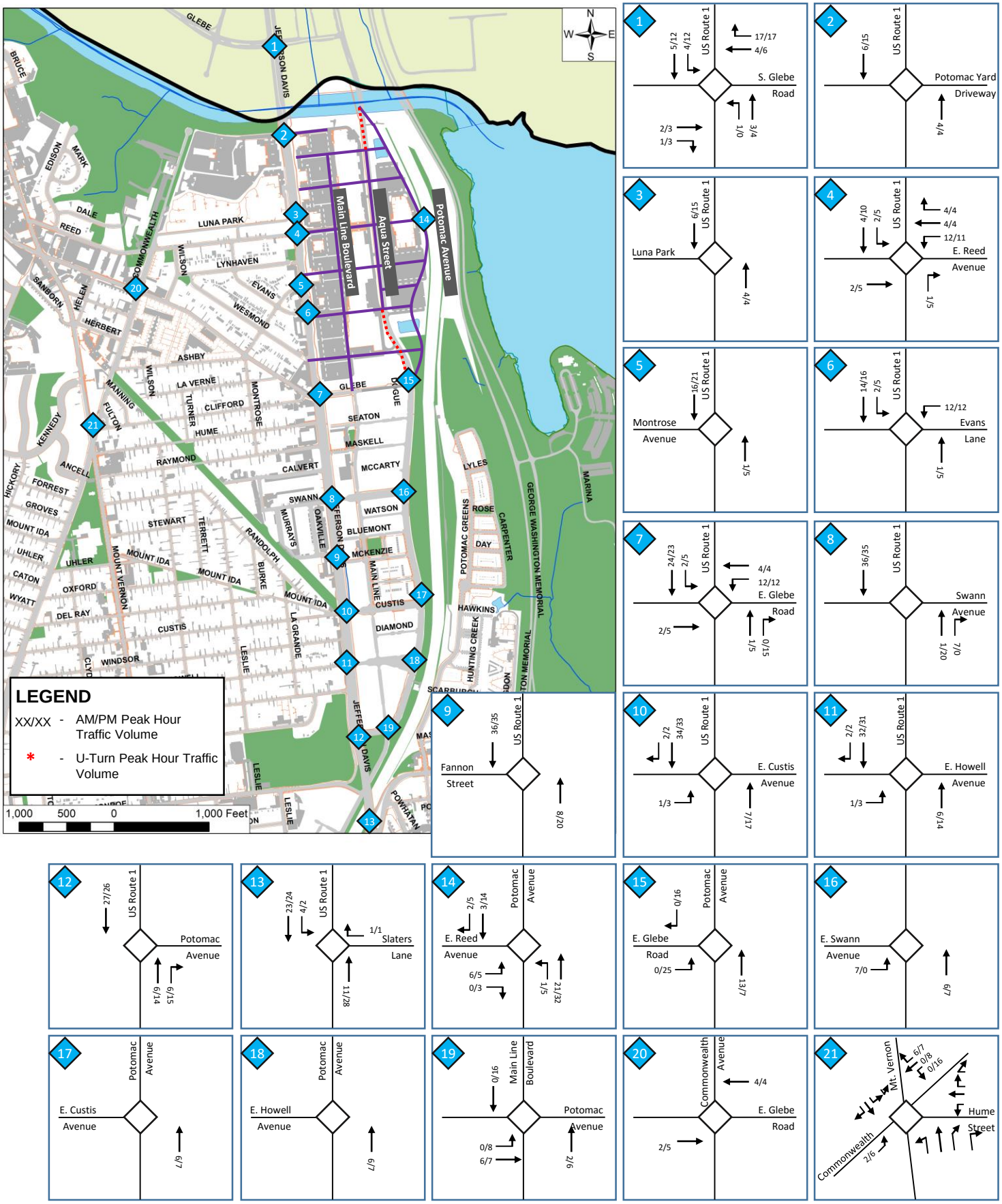
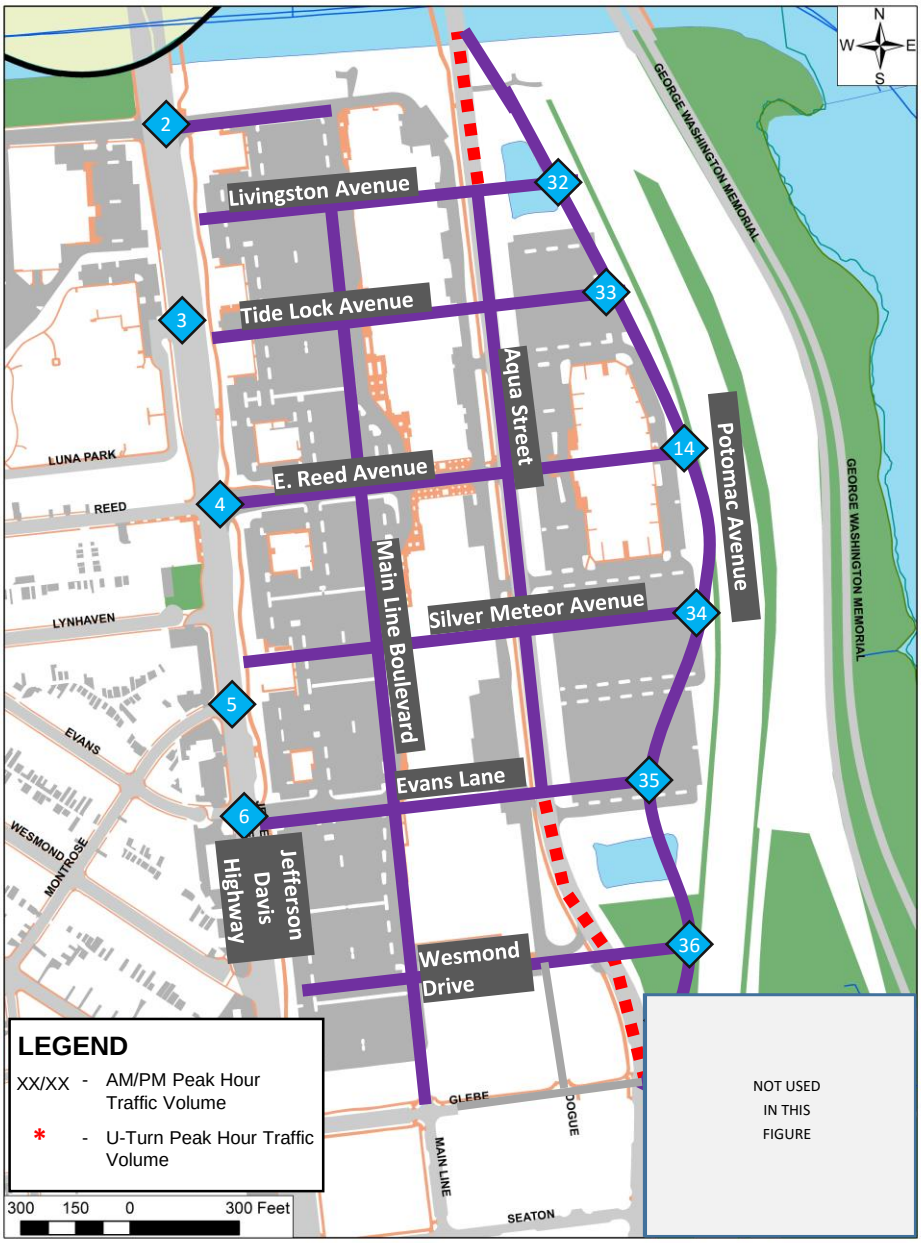


Figure 5-4: Phase 1 Site Generated Peak Hour Traffic Volumes (2010 Plan) **Sheet 1 of 2**



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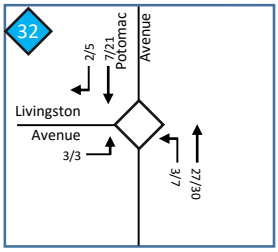
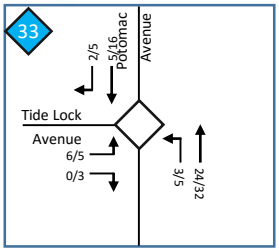
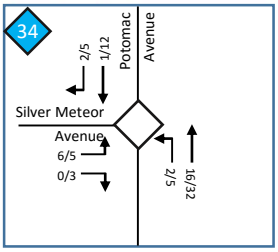
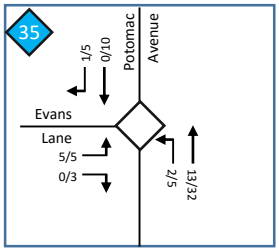








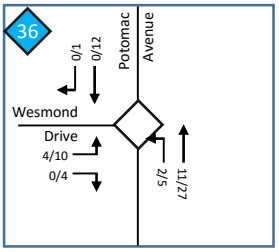


Figure 5-4: Phase 1 Site Generated Peak Hour Traffic Volumes (2010 Plan) **Sheet 2 of 2**

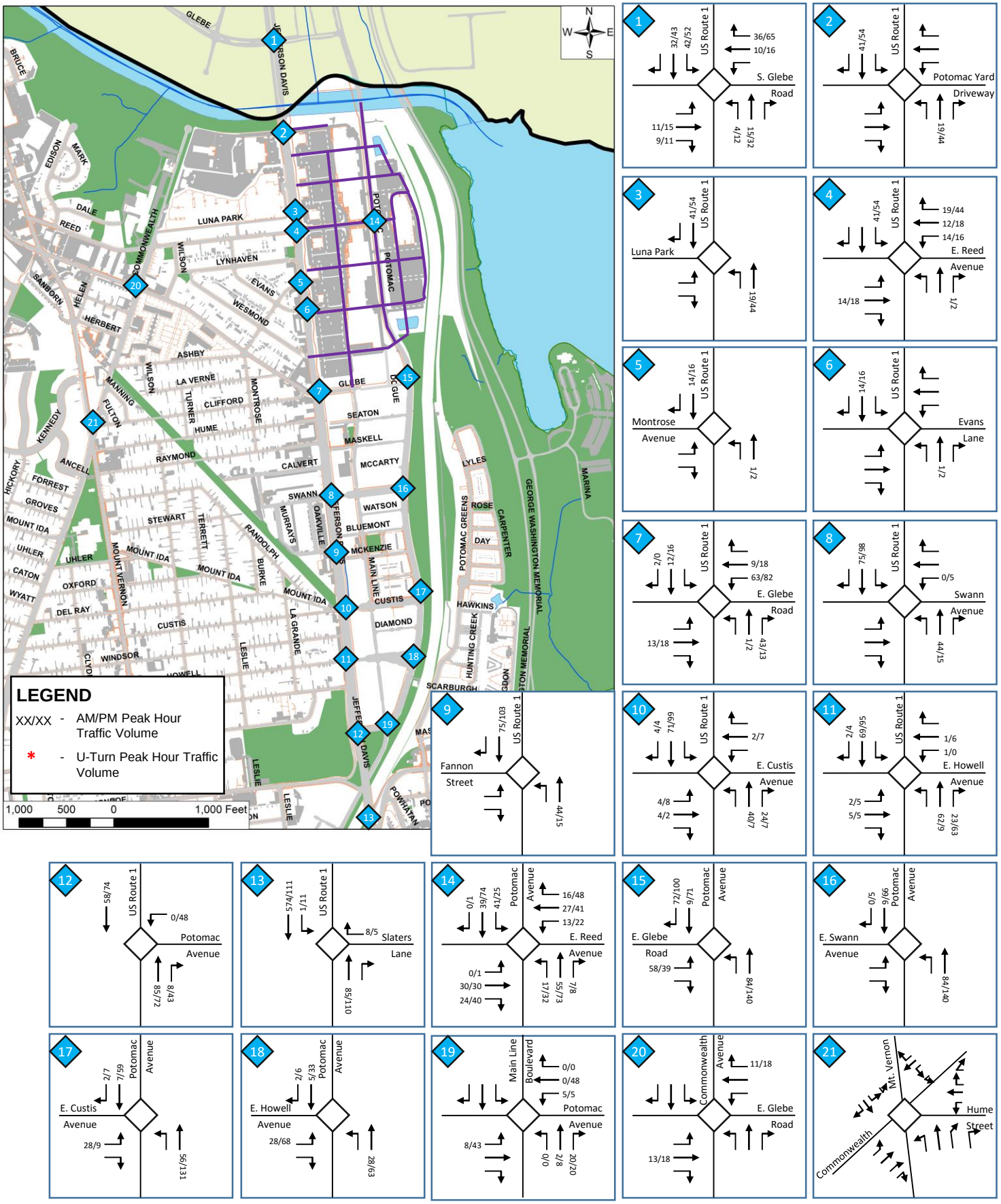
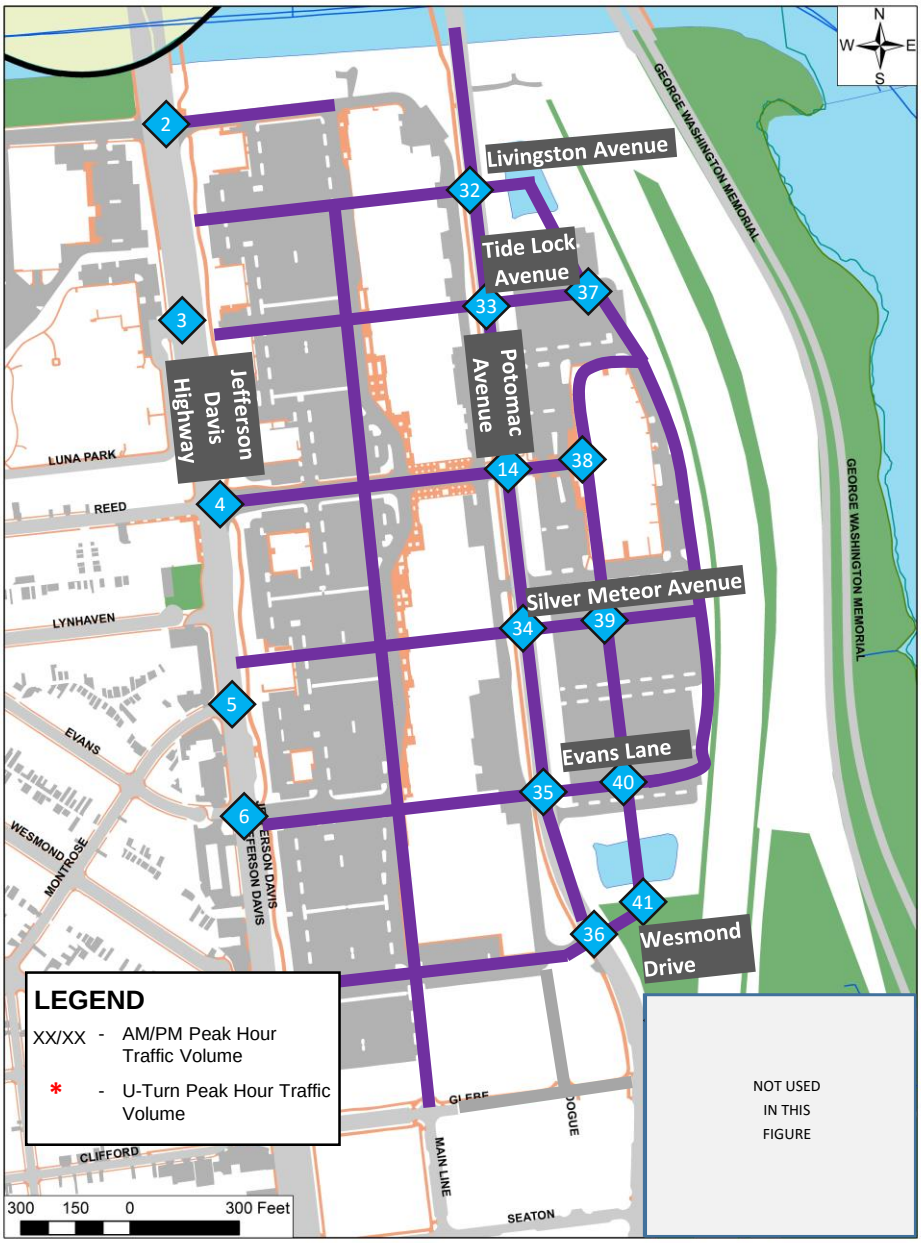


Figure 5-5: Phase 1 Site Generated Peak Hour Traffic Volumes (Updated Plan) **Sheet 1 of 2**



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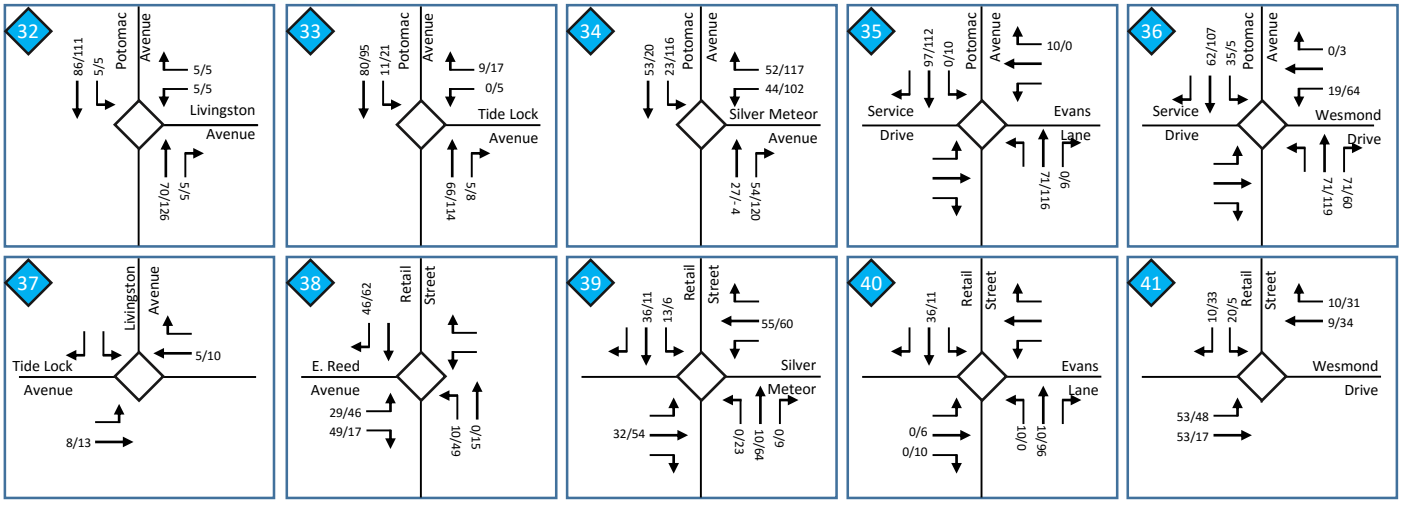


Figure 5-5: Phase 1 Site Generated Peak Hour Traffic Volumes (Updated Plan) Sheet 2 of 2

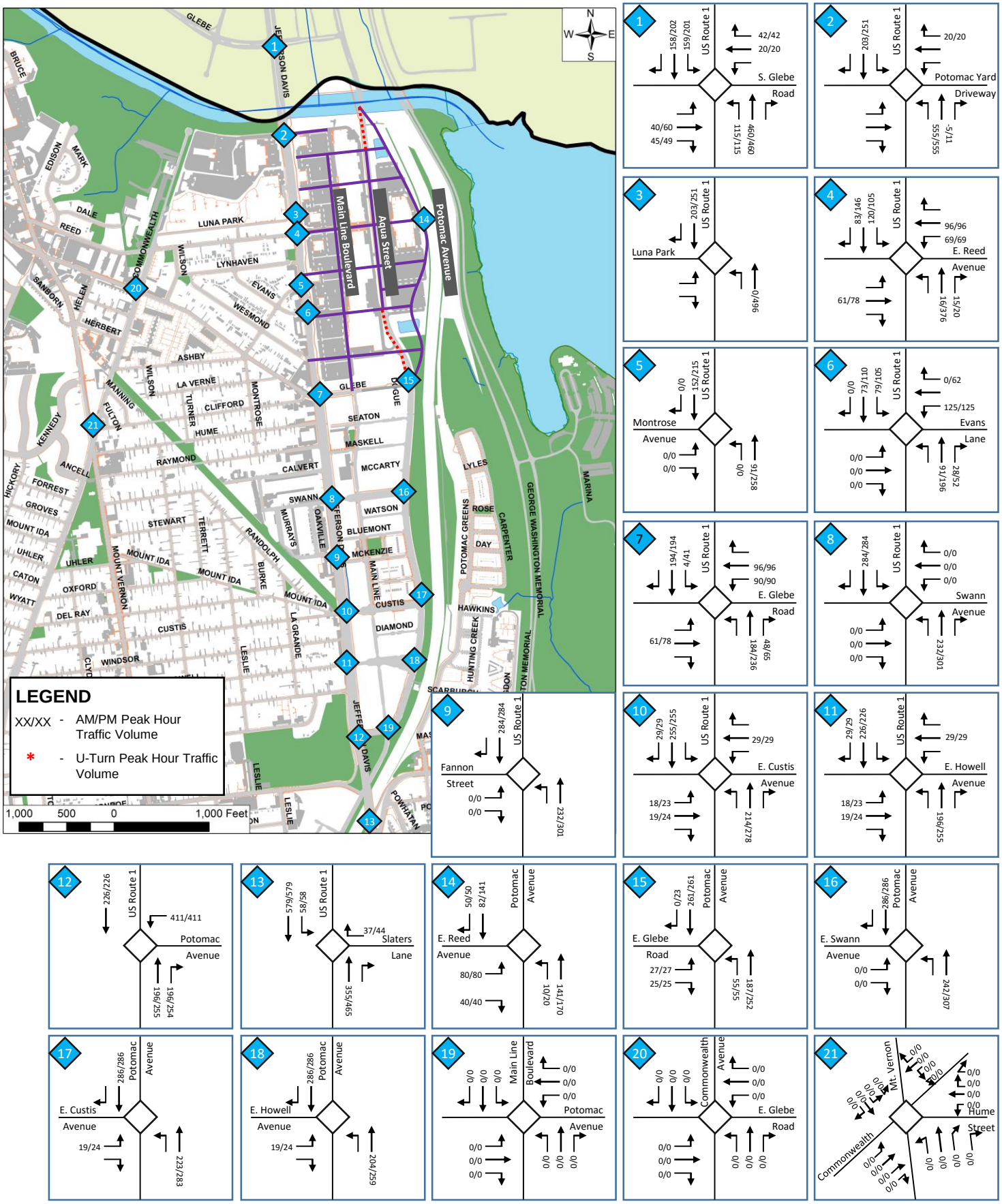


Figure 5-6: Full-Build Out Site Generated Peak Hour Traffic Volumes (2010 Plan) Sheet 1 of 2

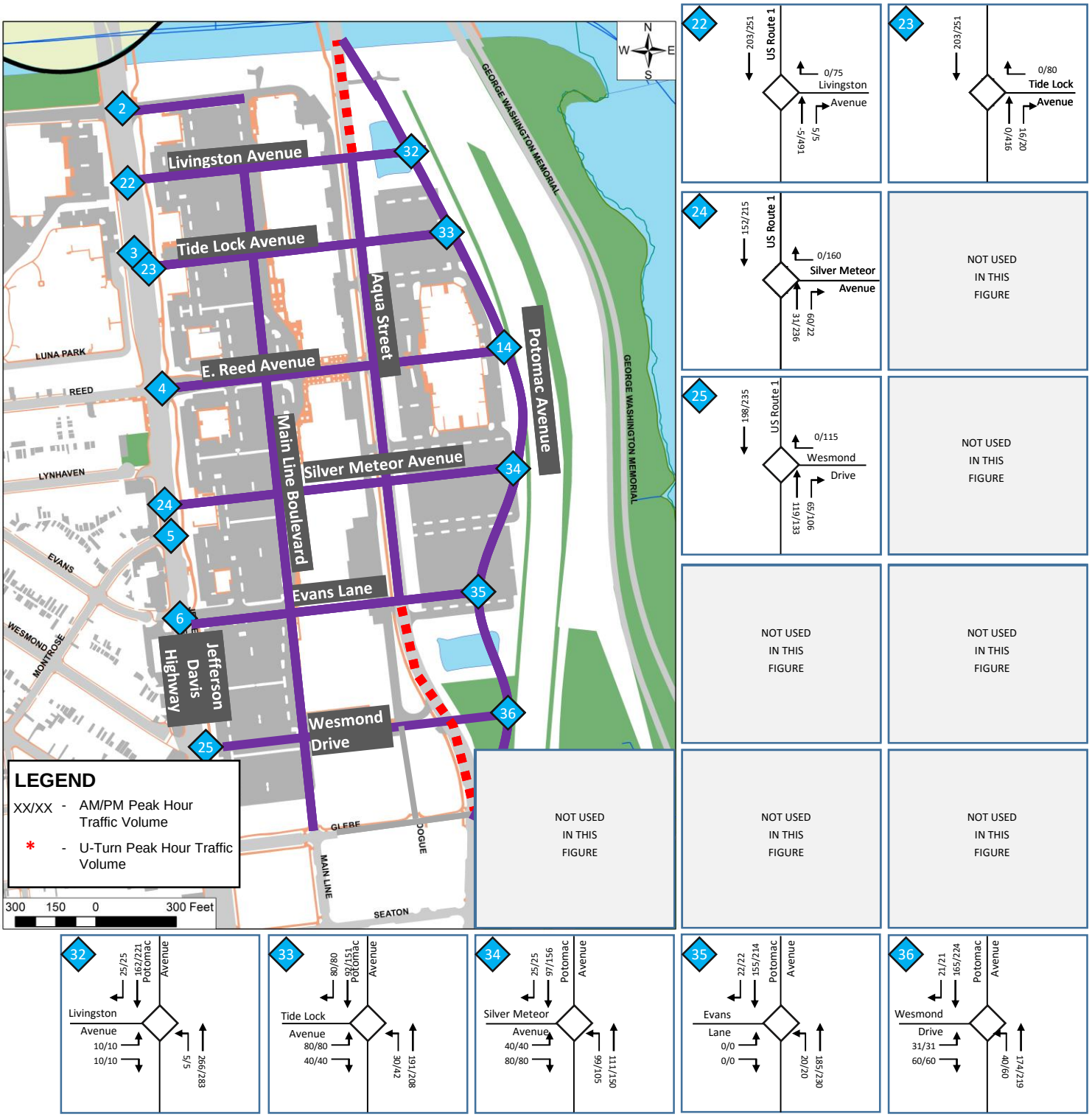


Figure 5-6: Full-Build Out Site Generated Peak Hour Traffic Volumes (2010 Plan) **Sheet 2 of 2**

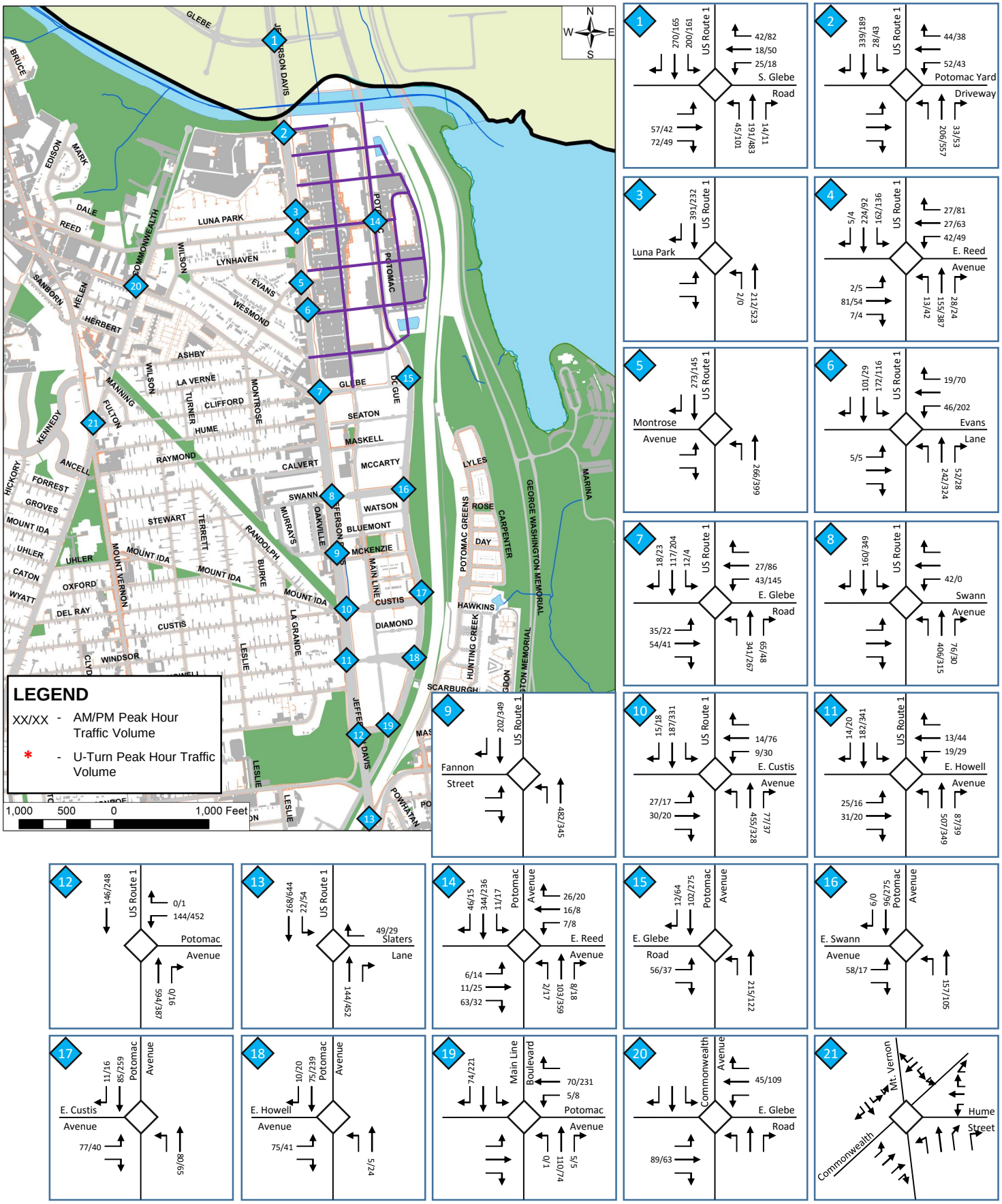


Figure 5-7: Full Build-Out Site Generated Peak Hour Traffic Volumes (Updated Plan) Sheet 1 of 2

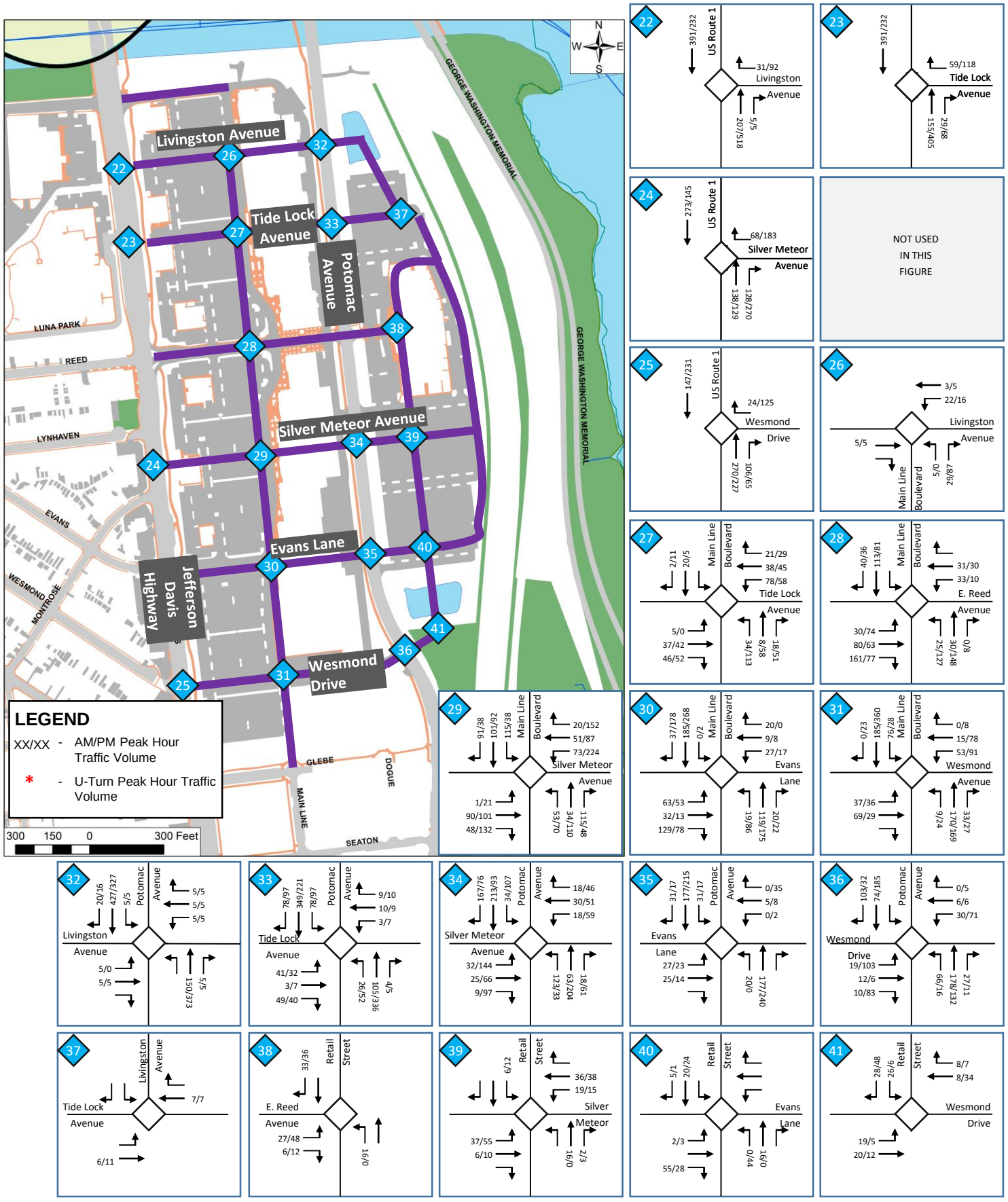


Figure 5-7: Full Build-Out Site Generated Peak Hour Traffic Volumes (Updated Plan) Sheet 2 of 2

6. Analysis of 2021 Phase I Conditions

6.1 OVERVIEW

This chapter examines the multimodal transportation impacts for the 2021 Phase I conditions with the inclusion of traffic generated by North Potomac Yard. Included are descriptions of the future transportation network, future traffic volumes, and future traffic impacts with respect to delay, queuing, and travel time. Both the 2010 Plan and the Updated Plan were analyzed.

6.2 STREET NETWORK

The 2021 Phase I street network is generally the same as the existing conditions, with the exception of any planned or programmed transportation improvements (as described in **Chapter 4**). The street network will be expanded to include the Phase I development of North Potomac Yard. The Updated Plan considers the development of Phase I primarily to the east of the current alignment of Potomac Avenue, replacing the current theatre land use. At Phase I, this street network will include five new signalized intersections along Potomac Avenue (Wesmond Drive, Silver Meteor Avenue, Evans Lane, East Reed Avenue, and Tide Lock Avenue) and one unsignalized intersection along Potomac Avenue (Livingston Avenue). The Phase I concept for the Updated Plan was previously shown as **Figure 2-2.**

Additionally, with any meaningful development of North Potomac Yard the City will pursue an improvement of the intersection of E. Reed Avenue and US Route 1. The improvement will upgrade the intersection to allow eastbound and westbound through movements.

To enhance the pedestrian character during Phase I of development, Potomac Avenue in the vicinity of the site will operate with two lanes of traffic in the peak direction during peak hours and one lane of traffic in the off-peak direction during peak hours. The outer lane in the off-peak direction will be used for parking during the peak hours. During off-peak hours and on weekends, Potomac Avenue will operate with one travel lane and one parking lane in each direction.

It is noted the Updated Plan differs from the 2010 Plan, which considered the relocation of Potomac Avenue such that it would become the easternmost street in the area. This difference is reflected in the analysis of the two plans.

The 2021 Phase I conditions study intersections and lane configurations are shown on **Figure 6-1** and **Figure 6-2**, for the 2010 Plan and Updated Plan, respectively.

6.3 TRANSIT NETWORK

The 2021 Phase I transit network is generally the same as the existing conditions, with the exception of any planned or programmed transportation improvements (as described in **Chapter 4**). For 2021 Phase I conditions, the alignment of the Metroway remains the same with Metroway operating in dedicated lanes along US Route 1 from Potomac Avenue to E. Glebe Road and then operating in mixed traffic along E. Glebe Road and along Potomac Avenue. It is anticipated that bus routes may be updated or added to provide service to the Phase I development and the future Metrorail Station.

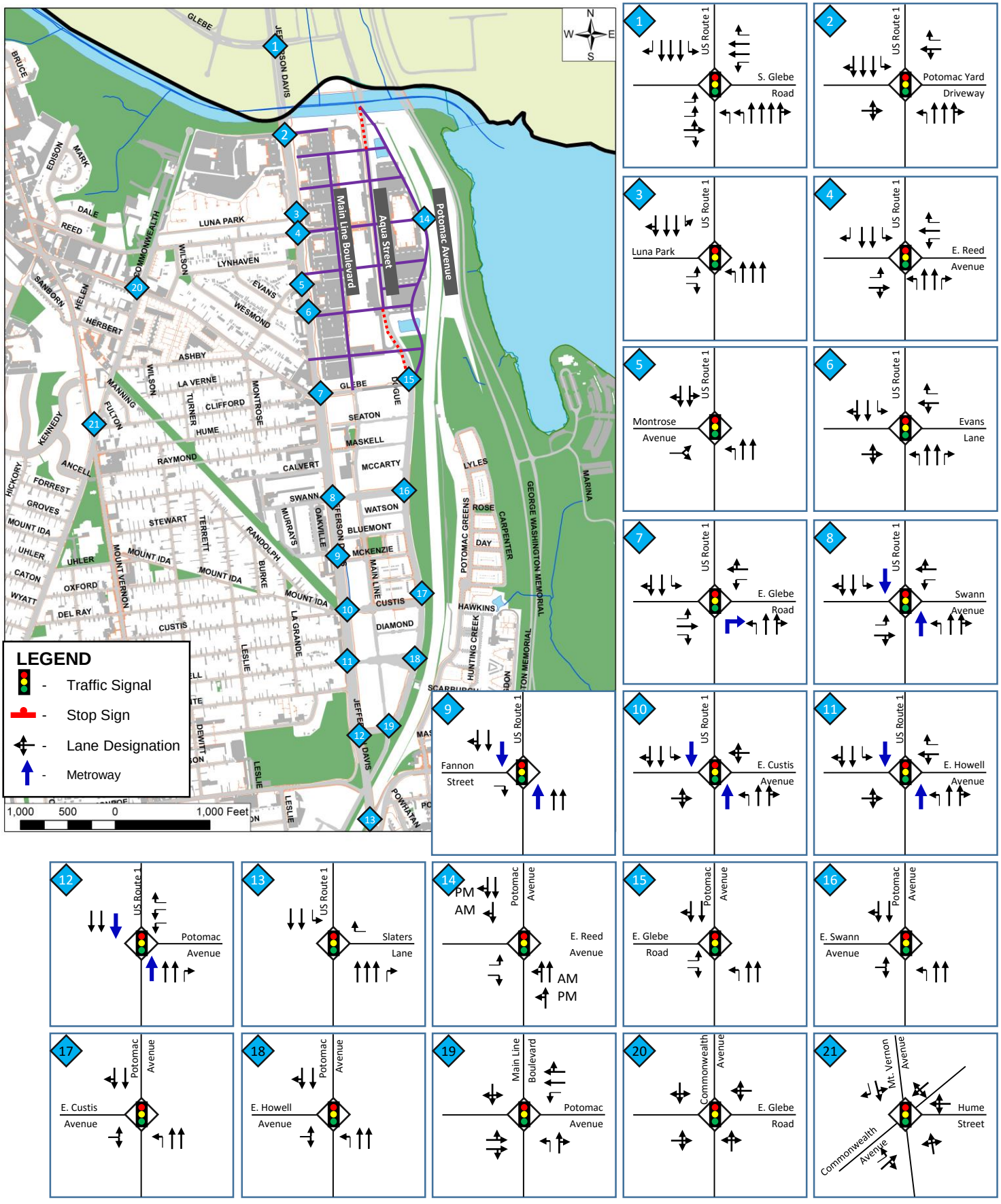
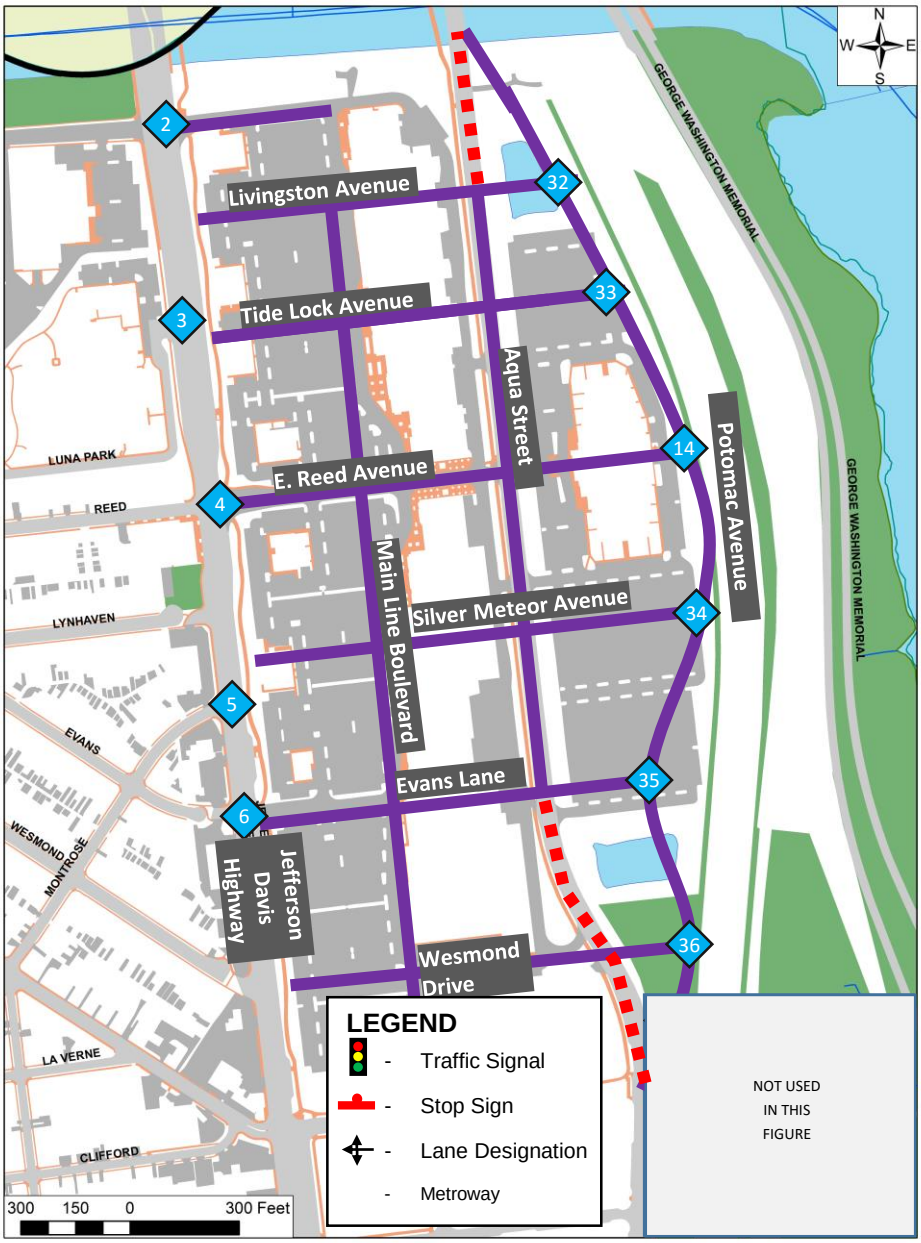


Figure 6-1: Phase I Study Intersections and Lane Designations (2010 Plan) Sheet 1 of 2



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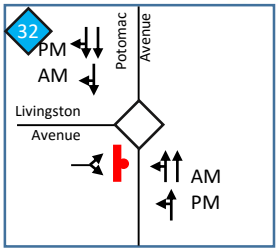
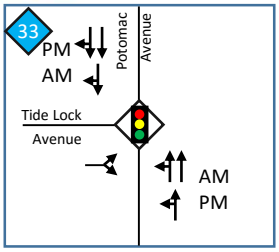
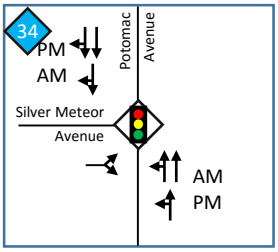
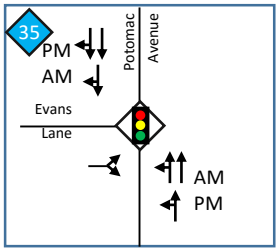








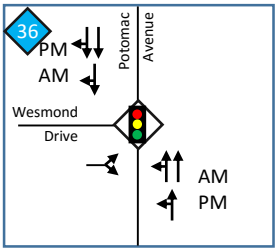


Figure 6-1: Phase I Study Intersections and Lane Designations (2010 Plan) **Sheet 2 of 2**

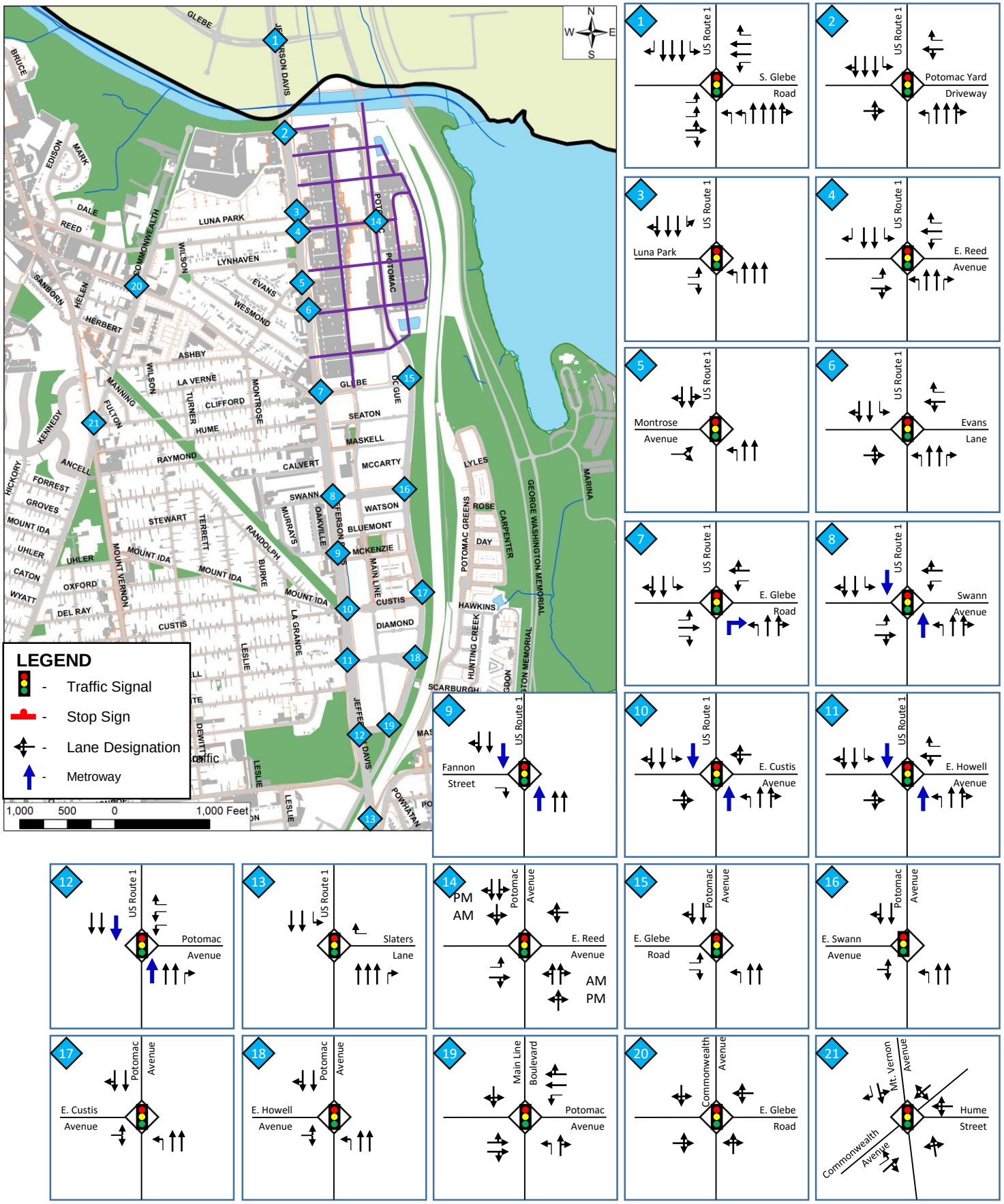


Figure 6-2: Phase 1 Study Intersections and Lane Designations (Updated Plan) Sheet 1 of 2

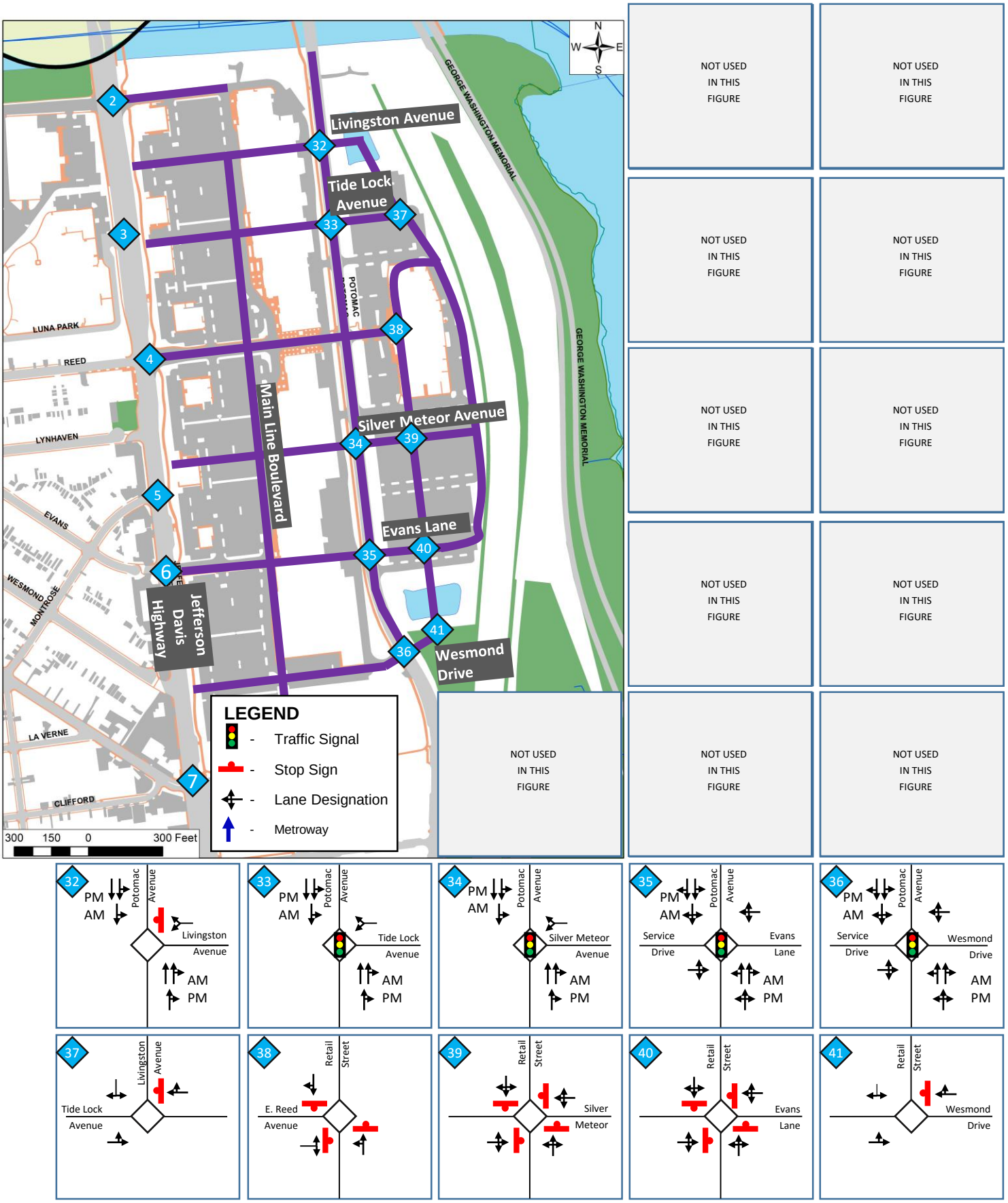


Figure 6-2: Phase 1 Study Intersections and Lane Designations (Updated Plan) **Sheet 2 of 2**

6.4 BICYCLE AND PEDESTRIAN MOBILITY

The 2021 Phase I bicycle and pedestrian network is generally the same as the existing conditions, with the exception of any planned or programmed transportation improvements (as described in **Chapter 4**) or any development specific frontage improvements. The Updated Plan will also complete the Potomac Yard Trail between E. Glebe Road and the extended Four Mile Run Trail. On-Street bicycle facilities will be implemented along certain primary streets within the site and will complement off-street paths and trails and connect Potomac Avenue to the linear park/. Signalized intersections will be provided at regular intervals to facilitate safe and accessible crossings of Potomac Avenue. Additionally, under Phase I the Potomac Avenue Trail will remain on the west side of Potomac Avenue.

6.5 2021 PHASE I TRAFFIC VOLUMES

2010 Plan

Phase I peak hour traffic volumes for the 2010 Plan were developed by adding the 2021 Background traffic volumes (**Figure 4-4**) to the Phase I site trips for the 2010 Plan (**Figure 5-4**) with consideration for the trip credit for existing uses that will be replaced. The resulting Phase I peak hour traffic volumes for the 2010 Plan are shown in **Figure 6-3**.

Updated Plan

2021 Phase I peak hour traffic volumes for the Updated Plan were developed by adding the 2021 Background traffic volumes (**Figure 4-4**) to the Phase I site trips for the Updated Plan (**Figure 5-5**) with consideration for the trip credit for existing uses. The resulting Phase I Updated Plan peak hour traffic volumes are shown in **Figure 6-4**

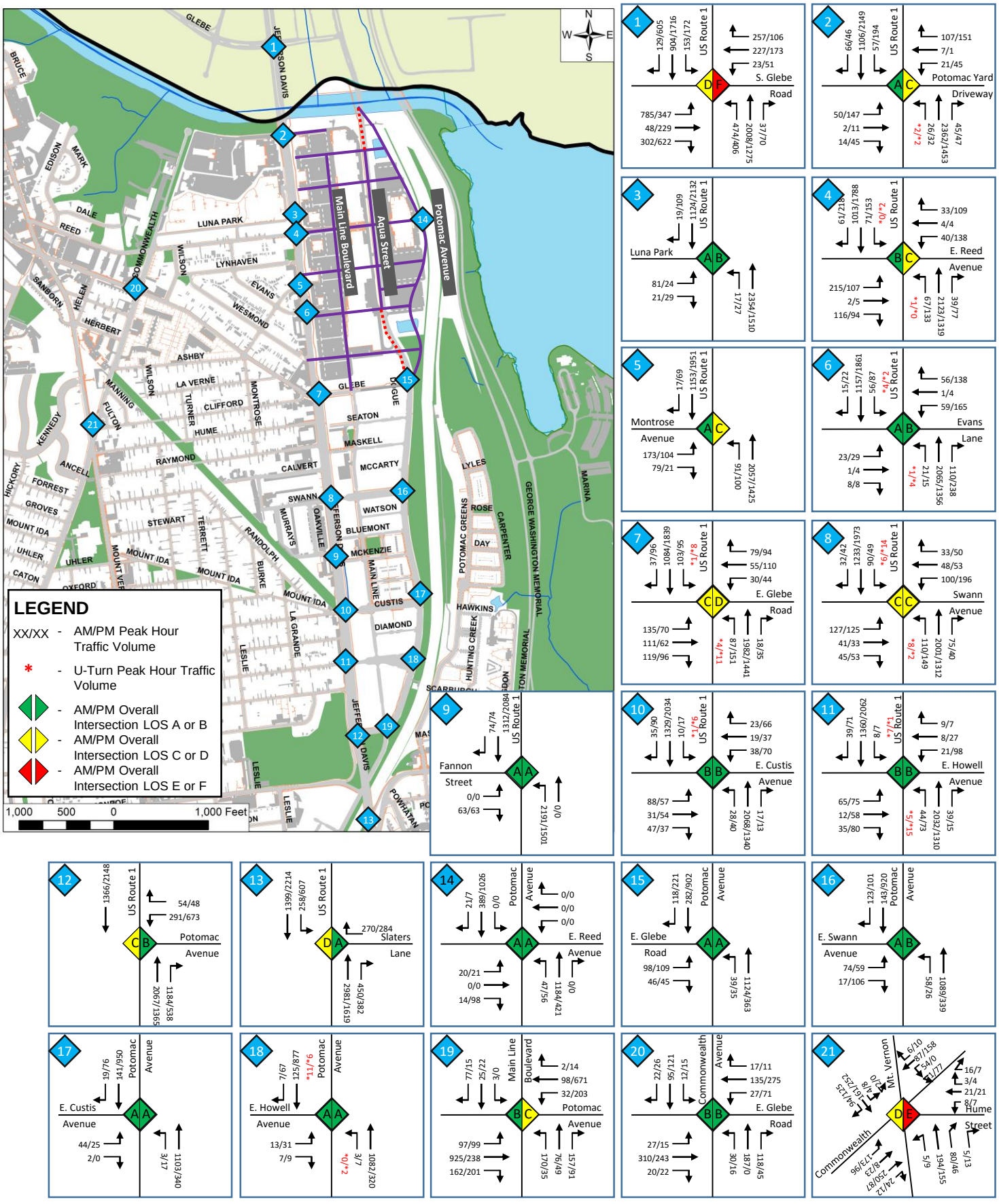
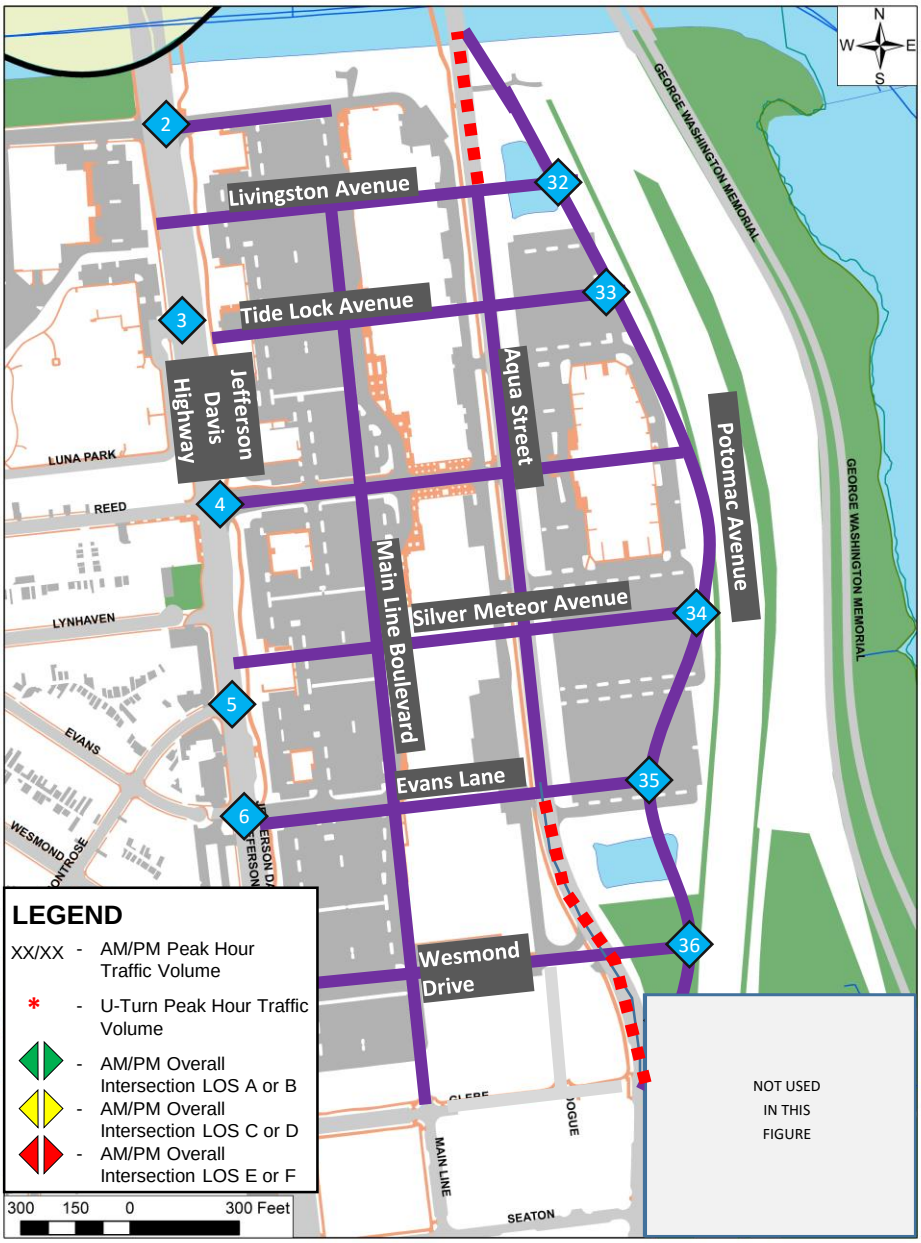


Figure 6-3: Phase I Total Peak Hour Traffic Volumes and LOS (2010 Plan) Sheet 1 of 2



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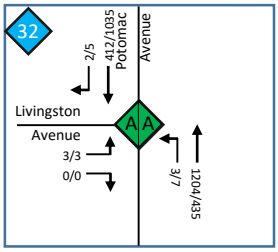
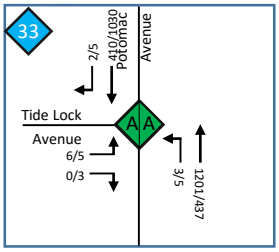
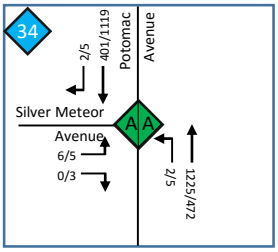
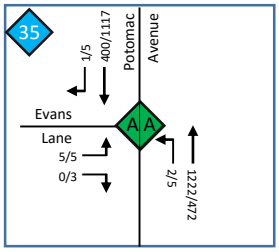








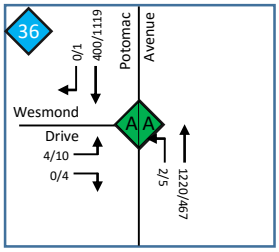


Figure 6-3: Phase I Peak Hour Total Traffic Volumes and LOS (2010 Plan) **Sheet 2 of 2**

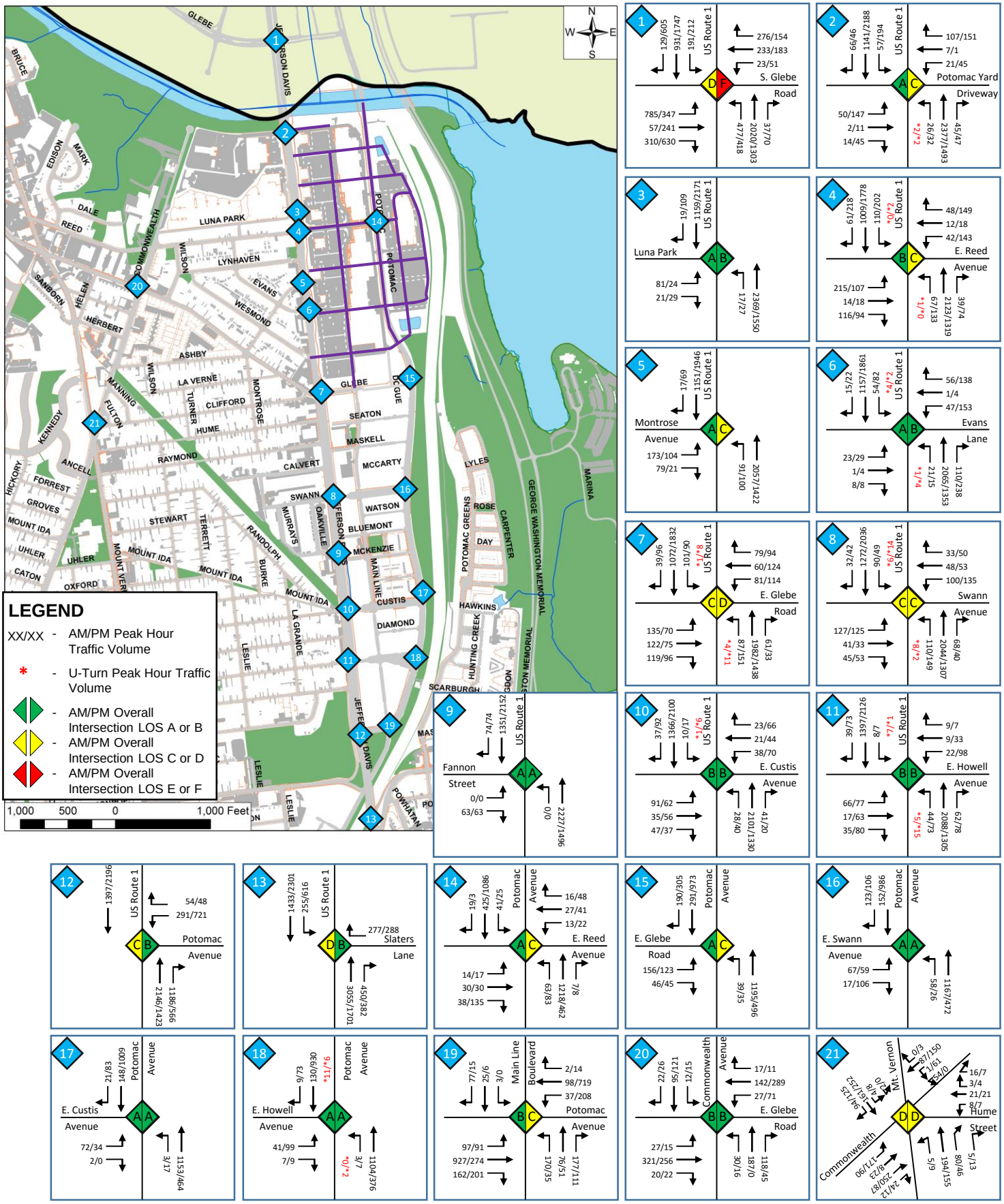
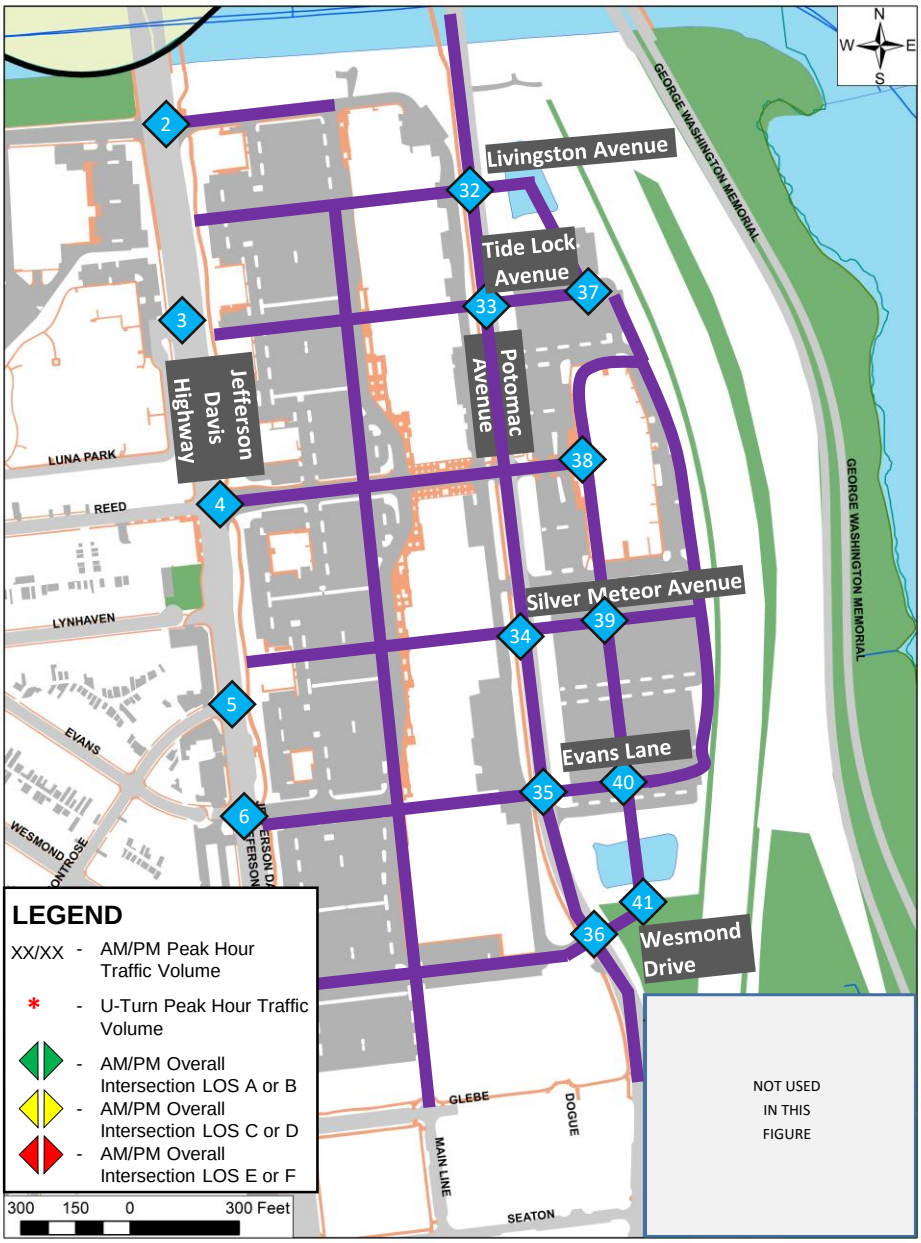


Figure 6-4: Phase I Total Peak Hour Traffic Volumes and LOS (Updated Plan) Sheet 1 of 2



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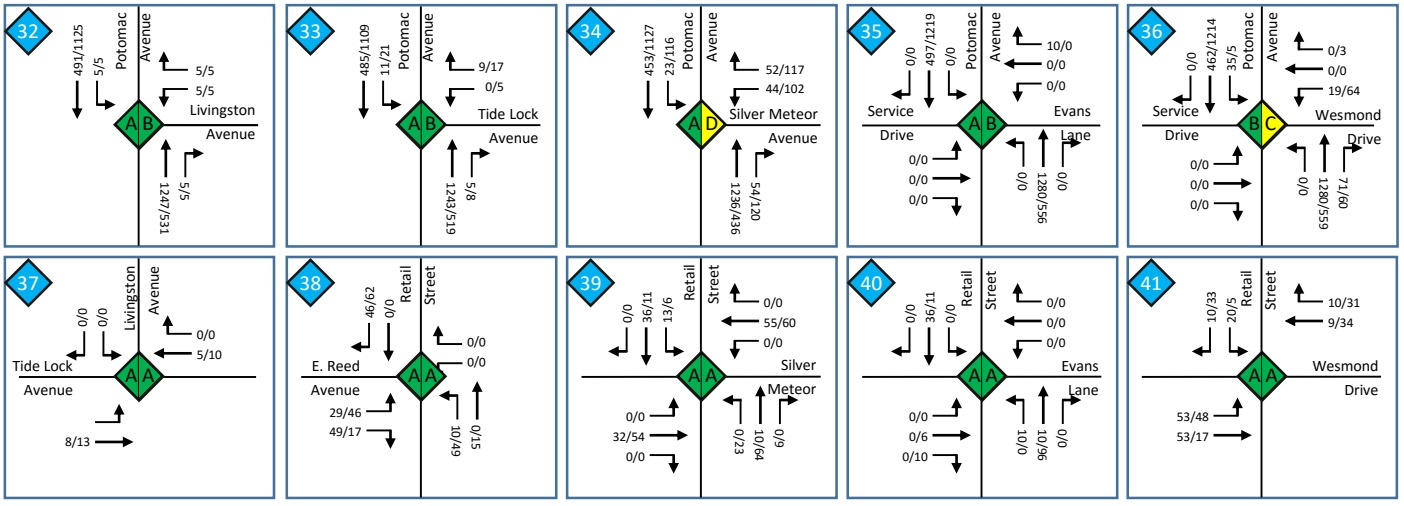


Figure 6-4: Phase I Total Peak Hour Traffic Volumes and LOS (Updated Plan) Sheet 2 of 2

6.6 2021 PHASE I CONDITIONS TRAFFIC ANALYSES

Traffic impact analyses were conducted for the 2021 Phase I study year. Consistent with the analysis of existing conditions, the analysis of intersections along US Route 1 and Potomac Avenue was prepared in VISSIM and the analysis of all other relevant study intersections was prepared in Synchro. The analysis considers traffic signal timing and phasing adjustments at existing intersections and the intersection specific improvements as discussed in Chapter 4.

Level of Service and Delay

Phase I analyses were based on the Phase I peak hour turning movement volumes, future Phase I lane use, and Phase I traffic control and signal timing at the study intersections. Results of the intersection capacity analyses are summarized in **Figure 6-3** and **Figure 6-4**, for the 2010 Plan and Updated Plan respectively and **in Table 6-1** for both scenarios. Synchro output reports are included in **Appendix D**. VISSIM output tables are included in **Appendix E.**

The analyses show that under the Updated Plan, all study intersections operate at an overall acceptable LOS D or better during both the AM and PM peak hours with the exception of the intersection of US Route 1 and S. Glebe Road, which operates at LOS F during the PM peak hour under both the Updated Plan and the 2010 Plan. The Updated Plan adds less than six seconds to the overall intersection delay at this intersection in comparison to the 2010 Plan results.

It is noted that the intersection of S. Glebe Road and US Route 1 is within the boundaries of Arlington County. The intersection serves as a gateway between Arlington and Alexandria and is one of the final full access intersections prior to US Route 1 becoming essentially limited access to the north. The City may benefit from coordinating with the County in the future to implement appropriate mitigation measures and traffic signal coordination at this intersection to prevent it from becoming a bottleneck in the travel between the City and Arlington County.

The analysis results demonstrate that the Updated Plan traffic impacts are generally consistent with the 2010 Plan traffic impacts.

During the AM peak hour, all US Route 1 intersections operate at the same LOS under both the Updated Plan and the 2010 Plan. During the AM peak hour, all Potomac Avenue intersections operate at the same LOS under both the Updated Plan and the 2010 Plan, with the exception of the intersection of Potomac Avenue and Wesmond Drive which changes from LOS A to B due to a 3.2 second increase in overall intersection delay. This increase in overall delay is negligible to the average driver.

During the PM peak hour, all US Route 1 intersections operate at the same LOS under both the Updated Plan and the 2010 Plan except for the intersection of Slaters Lane and US Route 1 which changes from LOS A to LOS B due to a 1.8 second increase in overall intersection delay. This increase in overall delay is negligible to the average driver.

Existing intersections along Potomac Avenue will generally operate with the same LOS when comparing the two plans. Instances where LOS for the Updated Plan are lower than the 2010 Plan LOS are due to a more detailed assignment of traffic through the grid network of streets. This still results in intersections operating at overall LOS D or better during both the AM and PM peak hours.

The new intersections (site entrances) of the Updated Plan and the 2010 Plan operate at an overall LOS D or better during both the AM and PM peak hours under both plan conditions. It is noted that the Updated Plan retains Potomac Avenue in its current alignment, with Phase I development occurring to the east of Potomac Avenue. The 2010 Plan considered Potomac Avenue to be relocated as the easternmost street in the area. This results in a different orientation of internal intersections with Potomac Avenue. As a result, the vehicle delays at these intersections will be slightly more under the Updated Plan than in the 2010 Plan.

The results show that the Updated Plan and the 2010 Plan have similar traffic impacts, and the specific mix and location of land uses in the Updated Plan results in traffic impacts that are consistent with traffic impacts that were previously approved by the City and VDOT.

Table 6-1: Phase I Intersection Capacity Analyses – Delay (LOS) (seconds/vehicle)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and S. Glebe Road	NB	LT	73.4 (E)	*37 (D)*	76.5 (E)	*40.4 (D)*	77.1 (E)	*40.6 (D)*	77.4 (E)	*42.4 (D)*
		TH	25.8 (C)		30.4 (C)		29.4 (C)		32.7 (C)	
		RT	16.3 (B)		16.7 (B)		19.3 (B)		19.2 (B)	
	SB	LT	73 (E)	*39.6 (D)*	111.4 (F)	*89.4 (F)*	72.2 (E)	*41.3 (D)*	116.4 (F)	*95 (F)*
		TH	38.2 (D)		92.2 (F)		39.3 (D)		98.2 (F)	
		RT	9.9 (A)		75.1 (E)		9.3 (A)		78.1 (E)	
	EB	LT	64.9 (E)	*51.3 (D)*	176.3 (F)	*232.6 (F)*	65.6 (E)	*51.5 (D)*	193.5 (F)	*252.4 (F)*
		TH	72.4 (E)		202.2 (F)		65.8 (E)		216.5 (F)	
		RT	12.1 (B)		274.3 (F)		13 (B)		297.6 (F)	
	WB	LT	66.8 (E)	*41 (D)*	66.4 (E)	*50 (D)*	69.1 (E)	*41.4 (D)*	73.2 (E)	*46.3 (D)*
		TH	71.2 (E)		72.3 (E)		71.8 (E)		71.7 (E)	
		RT	12.7 (B)		5.8 (A)		14.9 (B)		6.8 (A)	
	Intersection		***41.1 (D)***		***99 (F)***		***43.2 (D)***		***104.5 (F)***	
US Route 1 and Potomac Yard Driveway opposite Alexandria Toyota	NB	U-Turn	70.6 (E)	*4.8 (A)*	72.6 (E)	*17.1 (B)*	80.7 (F)	*5 (A)*	65.7 (E)	*17 (B)*
		LT	80.8 (F)		75.2 (E)		83 (F)		74.8 (E)	
		TH	3.4 (A)		15.9 (B)		3.6 (A)		15.8 (B)	
		RT	2.7 (A)		10.9 (B)		3.2 (A)		11.1 (B)	
	SB	LT	49.7 (D)	*12.3 (B)*	90.7 (F)	*32.2 (C)*	52.3 (D)	*13 (B)*	94.6 (F)	*33.9 (C)*
		TH	10.5 (B)		26.9 (C)		11.2 (B)		28.6 (C)	
		RT	13.6 (B)		22.4 (C)		14.1 (B)		23.2 (C)	
	EB	LT	77.3 (E)	*74.1 (E)*	63.9 (E)	*60.9 (E)*	75.8 (E)	*72.7 (E)*	66.5 (E)	*63.7 (E)*
		TH	0 (A)		65.4 (E)		0 (A)		68.9 (E)	
		RT	35.9 (D)		49.7 (D)		35.5 (D)		53.4 (D)	
	WB	LT	66.1 (E)	*15.7 (B)*	65 (E)	*19.3 (B)*	69.9 (E)	*16.2 (B)*	66.4 (E)	*19.6 (B)*
		TH	77.3 (E)		40.6 (D)		70.6 (E)		41.2 (D)	
		RT	6.3 (A)		5.7 (A)		6.9 (A)		5.7 (A)	
	Intersection		***8.8 (A)***		***27.4 (C)***		***9.4 (A)***		***28.4 (C)***	
US Route 1 and Luna Park Drive	NB	LT	4.8 (A)	*1.2 (A)*	29.5 (C)	*1.3 (A)*	4.6 (A)	*1.2 (A)*	26.1 (C)	*1.2 (A)*
		TH	1.2 (A)		0.8 (A)		1.2 (A)		0.8 (A)	
	SB	TH	4.8 (A)	*4.8 (A)*	29 (C)	*28.2 (C)*	5.2 (A)	*5.2 (A)*	28.1 (C)	*27.3 (C)*
		RT	3.8 (A)		12.8 (B)		3.6 (A)		12.2 (B)	
	EB	LT	72.3 (E)	*58.6 (E)*	75.3 (E)	*37.9 (D)*	72 (E)	*58.3 (E)*	74.2 (E)	*37.4 (D)*
		RT	4.7 (A)		8.2 (A)		4.4 (A)		8.2 (A)	
	Intersection		***4 (A)***		***17.1 (B)***		***4.2 (A)***		***16.5 (B)***	

Table 6-1: Phase I Intersection Capacity Analyses – Delay (LOS) (seconds/vehicle)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and E. Reed Avenue	NB	U-Turn	7.1 (A)	*9.2 (A)*	0 (A)	*12.3 (B)*	9.9 (A)	*10.6 (B)*	0 (A)	*13.5 (B)*
		LT	13.5 (B)		48.1 (D)		13.1 (B)		46.6 (D)	
		TH	9.1 (A)		9.4 (A)		10.6 (B)		10.8 (B)	
		RT	4.5 (A)		3.2 (A)		3.8 (A)		3.3 (A)	
	SB	U-Turn	0 (A)	*12.5 (B)*	54.1 (D)	*36.9 (D)*	0 (A)	*14.5 (B)*	65.1 (E)	*37.2 (D)*
		LT	55.9 (E)		47 (D)		63.7 (E)		52.9 (D)	
		TH	9.8 (A)		37.6 (D)		9.6 (A)		37 (D)	
		RT	9 (A)		23.7 (C)		8.5 (A)		23.6 (C)	
	EB	LT	66.7 (E)	*52.6 (D)*	63.2 (E)	*54.6 (D)*	70.7 (E)	*58.9 (E)*	67.1 (E)	*57.5 (E)*
		TH	75.8 (E)		67.2 (E)		79.2 (E)		58.6 (E)	
		RT	26.3 (C)		43.7 (D)		35.4 (D)		46.1 (D)	
	WB	LT	86.3 (F)	*56.4 (E)*	94.8 (F)	*58.6 (E)*	73.5 (E)	*46.8 (D)*	88.7 (F)	*50.9 (D)*
		TH	52.8 (D)		79.7 (E)		52.4 (D)		69.9 (E)	
		RT	20.8 (C)		12.8 (B)		20.7 (C)		13.2 (B)	
	Intersection		***15.1 (B)***		***29.8 (C)***		***17.3 (B)***		***30.7 (C)***	
US Route 1 and Montrose Avenue	NB	LT	13.3 (B)	*5.6 (A)*	37.1 (D)	*5.4 (A)*	12.7 (B)	*5.8 (A)*	36.7 (D)	*5.5 (A)*
		TH	5.3 (A)		3.3 (A)		5.5 (A)		3.4 (A)	
	SB	TH	2.6 (A)	*2.6 (A)*	29.2 (C)	*29 (C)*	2.4 (A)	*2.4 (A)*	30.6 (C)	*30.6 (C)*
		RT	3.2 (A)		24.5 (C)		3.4 (A)		29.2 (C)	
	EB	LT	62.6 (E)	*57.6 (E)*	136.9 (F)	*134.2 (F)*	62.4 (E)	*57.5 (E)*	128.1 (F)	*124.4 (F)*
		RT	46.3 (D)		120.6 (F)		46.7 (D)		105.8 (F)	
	Intersection		***8.3 (A)***		***22.6 (C)***		***8.4 (A)***		***23.3 (C)***	
US Route 1 and Evans Lane	NB	U-Turn	5.1 (A)	*4.8 (A)*	12.5 (B)	*5 (A)*	3.9 (A)	*4.3 (A)*	7.4 (A)	*4.5 (A)*
		LT	4 (A)		6.5 (A)		4.3 (A)		4.1 (A)	
		TH	4.8 (A)		5.1 (A)		4.3 (A)		4.7 (A)	
		RT	4 (A)		3.9 (A)		3.7 (A)		3.5 (A)	
	SB	U-Turn	2.4 (A)	*1.1 (A)*	14.7 (B)	*17.2 (B)*	3.2 (A)	*0.8 (A)*	7.9 (A)	*18.6 (B)*
		LT	2 (A)		8.3 (A)		1.7 (A)		7.6 (A)	
		TH	1 (A)		17.7 (B)		0.8 (A)		19.2 (B)	
		RT	1.7 (A)		15.2 (B)		0.9 (A)		13.4 (B)	
	EB	LT	74.8 (E)	*60.3 (E)*	59.2 (E)	*55.2 (E)*	74.6 (E)	*60.1 (E)*	57.4 (E)	*53.5 (D)*
		TH	65.7 (E)		55.4 (E)		65.6 (E)		46.9 (D)	
		RT	25.7 (C)		41 (D)		25.6 (C)		43.3 (D)	
	WB	LT	74.5 (E)	*73 (E)*	66.8 (E)	*67 (E)*	71 (E)	*71.9 (E)*	69.6 (E)	*68.5 (E)*
		TH	90.9 (F)		77 (E)		57.8 (E)		60.6 (E)	
		RT	71 (E)		66.9 (E)		73 (E)		67.4 (E)	
	Intersection		***6.1 (A)***		***16.5 (B)***		***5.5 (A)***		***17.2 (B)***	

Table 6-1: Phase I Intersection Capacity Analyses – Delay (LOS) (seconds/vehicle)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and E. Glebe Road	NB	U-Turn	58.1 (E)	*12.8 (B)*	77.5 (E)	*19.4 (B)*	42.7 (D)	*12.8 (B)*	71.5 (E)	*20.7 (C)*
		LT	53.6 (D)		74 (E)		57.5 (E)		74.5 (E)	
		TH	10.9 (B)		13.9 (B)		10.9 (B)		15 (B)	
		RT	12 (B)		12.8 (B)		10.3 (B)		19.8 (B)	
	SB	U-Turn	79.8 (E)	*29.7 (C)*	105.5 (F)	*57.8 (E)*	127 (F)	*30.1 (C)*	158.7 (F)	*63.1 (E)*
		LT	104.5 (F)		104.2 (F)		106.8 (F)		137.9 (F)	
		TH	23.2 (C)		55.5 (E)		23.4 (C)		59.5 (E)	
		RT	19.6 (B)		53.7 (D)		20.8 (C)		58.2 (E)	
	EB	LT	54.5 (D)	*42 (D)*	49.7 (D)	*43.8 (D)*	55.1 (E)	*41.9 (D)*	47.6 (D)	*51.2 (D)*
		TH	59.8 (E)		56.8 (E)		57.6 (E)		78.1 (E)	
		RT	11.4 (B)		31.2 (C)		10.7 (B)		32.3 (C)	
	WB	LT	52.6 (D)	*56.7 (E)*	56 (E)	*60.6 (E)*	60.8 (E)	*57.9 (E)*	67.7 (E)	*69.8 (E)*
		TH	70.2 (E)		68.8 (E)		66.8 (E)		79 (E)	
		RT	49.7 (D)		52.5 (D)		48 (D)		60.4 (E)	
	Intersection		***23 (C)***		***41.4 (D)***		***23.8 (C)***		***46.2 (D)***	
US Route 1 and Swann Avenue	NB	U-Turn	58.9 (E)	*21.7 (C)*	95.4 (F)	*27.1 (C)*	57.6 (E)	*20.7 (C)*	118.4 (F)	*28.8 (C)*
		LT	63.5 (E)		106.1 (F)		64.4 (E)		106.3 (F)	
		TH	19.1 (B)		18.7 (B)		18.1 (B)		20.5 (C)	
		RT	20.9 (C)		20.1 (C)		17.7 (B)		21.3 (C)	
	SB	U-Turn	68 (E)	*20.2 (C)*	87.8 (F)	*12.7 (B)*	53.7 (D)	*19.8 (B)*	84.3 (F)	*13.8 (B)*
		LT	57.7 (E)		79.9 (E)		61.2 (E)		78.9 (E)	
		TH	17.3 (B)		10.6 (B)		16.7 (B)		11.8 (B)	
		RT	19.5 (B)		13 (B)		21.3 (C)		14.8 (B)	
	EB	LT	65 (E)	*61.4 (E)*	66 (E)	*61.4 (E)*	66.3 (E)	*62.8 (E)*	67.5 (E)	*62 (E)*
		TH	54.3 (D)		51.9 (D)		57.2 (E)		50.8 (D)	
		RT	57.9 (E)		55.8 (E)		58.5 (E)		55.1 (E)	
	WB	LT	60 (E)	*54.4 (D)*	57.2 (E)	*49.5 (D)*	60.8 (E)	*54.7 (D)*	56.3 (E)	*50.7 (D)*
		TH	54.5 (D)		49.2 (D)		54.4 (D)		55.1 (E)	
		RT	37.6 (D)		30.9 (C)		37.5 (D)		32 (C)	
	Intersection		***24.9 (C)***		***23 (C)***		***24.3 (C)***		***24.3 (C)***	
US Route 1 and Fannon Street	SB	TH	1.3 (A)	*1.3 (A)*	2.2 (A)	*2.2 (A)*	1.2 (A)	*1.2 (A)*	2.2 (A)	*2.2 (A)*
		RT	1.5 (A)		3.2 (A)		1.9 (A)		3 (A)	
	EB	RT	5.9 (A)	*5.9 (A)*	6.4 (A)	*6.4 (A)*	5.8 (A)	*5.8 (A)*	6.3 (A)	*6.3 (A)*
	Intersection		***1.5 (A)***		***2.4 (A)***		***1.4 (A)***		***2.3 (A)***	

Table 6-1: Phase I Intersection Capacity Analyses – Delay (LOS) (seconds/vehicle)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and E. Custis Avenue	NB	U-Turn	0 (A)	*11.9 (B)*	0 (A)	*8 (A)*	0 (A)	*10.2 (B)*	0 (A)	*10.2 (B)*
		LT	93.1 (F)		81.3 (F)		92.3 (F)		79.1 (E)	
		TH	11 (B)		6.1 (A)		9.3 (A)		8.3 (A)	
		RT	6.5 (A)		6.8 (A)		9.3 (A)		10.7 (B)	
	SB	U-Turn	87.2 (F)	*8.1 (A)*	86.4 (F)	*8.7 (A)*	66 (E)	*8 (A)*	86.8 (F)	*8.7 (A)*
		LT	80.2 (F)		85.5 (F)		77 (E)		84.8 (F)	
		TH	7.5 (A)		7.8 (A)		7.5 (A)		7.9 (A)	
		RT	8.5 (A)		10 (A)		9.3 (A)		10.1 (B)	
	EB	LT	66.3 (E)	*66.5 (E)*	72.5 (E)	*71.3 (E)*	69.6 (E)	*68.8 (E)*	80.3 (F)	*77.6 (E)*
		TH	68.6 (E)		67.8 (E)		63.6 (E)		73.5 (E)	
		RT	65.8 (E)		74.4 (E)		70.7 (E)		78.7 (E)	
	WB	LT	63.3 (E)	*62.6 (E)*	72.1 (E)	*71.7 (E)*	61.3 (E)	*61.3 (E)*	79.5 (E)	*77.4 (E)*
		TH	57.6 (E)		69.2 (E)		59.4 (E)		73.1 (E)	
		RT	65.9 (E)		72.8 (E)		63 (E)		78 (E)	
	Intersection		***14.3 (B)***		***13.7 (B)***		***13.5 (B)***		***15.3 (B)***	
US Route 1 and E. Howell Avenue	NB	U-Turn	93.4 (F)	*10.7 (B)*	122.4 (F)	*12.9 (B)*	87.8 (F)	*9.7 (A)*	130 (F)	*15 (B)*
		LT	90.2 (F)		121.3 (F)		91.1 (F)		127.5 (F)	
		TH	8.7 (A)		5.7 (A)		7.7 (A)		7.5 (A)	
		RT	8 (A)		6.8 (A)		7.8 (A)		8.8 (A)	
	SB	U-Turn	73.9 (E)	*8 (A)*	94.5 (F)	*6.8 (A)*	80.5 (F)	*8 (A)*	105.9 (F)	*7.6 (A)*
		LT	76 (E)		84.3 (F)		71 (E)		78.3 (E)	
		TH	7.1 (A)		6.3 (A)		7.1 (A)		7.2 (A)	
		RT	10.6 (B)		8.2 (A)		9.2 (A)		9 (A)	
	EB	LT	63.2 (E)	*65.6 (E)*	72.2 (E)	*74.1 (E)*	66 (E)	*65.6 (E)*	74.7 (E)	*75.8 (E)*
		TH	67.2 (E)		72.5 (E)		63.4 (E)		73 (E)	
		RT	69.7 (E)		76.9 (E)		65.8 (E)		78.9 (E)	
	WB	LT	71.7 (E)	*66.6 (E)*	96.7 (F)	*92.9 (F)*	71.5 (E)	*68.5 (E)*	107.7 (F)	*103.8 (F)*
		TH	55.4 (E)		89.1 (F)		67.7 (E)		101.7 (F)	
		RT	66 (E)		58.9 (E)		62.2 (E)		63.1 (E)	
	Intersection		***12 (B)***		***15.8 (B)***		***11.6 (B)***		***17.6 (B)***	
US Route 1 and Potomac Avenue	NB	TH	23.6 (C)	*33.7 (C)*	11.5 (B)	*10.1 (B)*	26.5 (C)	*34.9 (C)*	16.4 (B)	*14.1 (B)*
		RT	51.5 (D)		6.5 (A)		50.2 (D)		8.5 (A)	
	SB	TH	7.3 (A)	*7.3 (A)*	8.1 (A)	*8.1 (A)*	7.4 (A)	*7.4 (A)*	8.7 (A)	*8.7 (A)*
	WB	LT	83.5 (F)	*75.7 (E)*	49.9 (D)	*48.8 (D)*	81.4 (F)	*74.7 (E)*	52.2 (D)	*51.5 (D)*
		RT	34.3 (C)		33.5 (C)		38.6 (D)		41.7 (D)	
	Intersection		***28.9 (C)***		***15 (B)***		***29.5 (C)***		***17.6 (B)***	

Table 6-1: Phase I Intersection Capacity Analyses – Delay (LOS) (seconds/vehicle)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and Slaters Lane	NB	TH	55.5 (E)	*55.2 (E)*	10.5 (B)	*11.5 (B)*	58.5 (E)	*58.2 (E)*	13.1 (B)	*14.1 (B)*
		RT	53.1 (D)		15.7 (B)		56.3 (E)		18.8 (B)	
	SB	LT	54.9 (D)	*11.6 (B)*	28.3 (C)	*9.2 (A)*	53.7 (D)	*11.6 (B)*	32 (C)	*10.3 (B)*
		TH	3.9 (A)		4.1 (A)		4.4 (A)		4.7 (A)	
	WB	RT	32.7 (C)	*32.7 (C)*	5.4 (A)	*5.4 (A)*	37.5 (D)	*37.5 (D)*	7.2 (A)	*7.2 (A)*
	Intersection		***39.7 (D)***		***9.9 (A)***		***41.6 (D)***		***11.7 (B)***	
Potomac Avenue and E. Reed Avenue	NB	LT	7.6 (A)	*2.2 (A)*	24.5 (C)	*15.2 (B)*	11 (B)	*4.1 (A)*	56.4 (E)	*42.3 (D)*
		TH	2 (A)		14 (B)		3.7 (A)		39.9 (D)	
		RT	0 (A)		0 (A)		2.8 (A)		38.4 (D)	
	SB	LT	0 (A)	*7.6 (A)*	0 (A)	*3.1 (A)*	30.4 (C)	*17.4 (B)*	28.9 (C)	*23.9 (C)*
		TH	7.7 (A)		3.1 (A)		16.4 (B)		23.8 (C)	
		RT	6.5 (A)		2.6 (A)		14.2 (B)		13.9 (B)	
	EB	LT	29 (C)	*19.4 (B)*	27.1 (C)	*11.5 (B)*	33.6 (C)	*24.4 (C)*	32 (C)	*31.5 (C)*
		TH	0 (A)		0 (A)		34.1 (C)		35.9 (D)	
		RT	5.6 (A)		8.2 (A)		13.4 (B)		30.4 (C)	
	WB	LT	0 (A)	*6.4 (A)*	0 (A)	*7.6 (A)*	32.6 (C)	*23.5 (C)*	36.1 (D)	*23.3 (C)*
		TH	0 (A)		0 (A)		31.3 (C)		30 (C)	
		RT	6.4 (A)		7.6 (A)		10.5 (B)		14.3 (B)	
	Intersection		***4 (A)***		***7.3 (A)***		***9.3 (A)***		***29.7 (C)***	
Potomac Avenue and E. Glebe Road	NB	LT	5.9 (A)	*6.4 (A)*	5.3 (A)	*5.3 (A)*	5.2 (A)	*6 (A)*	20.1 (C)	*23.4 (C)*
		TH	6.4 (A)		5.3 (A)		6 (A)		23.6 (C)	
	SB	TH	2.5 (A)	*2.5 (A)*	6.7 (A)	*6.9 (A)*	4.7 (A)	*4.4 (A)*	13.8 (B)	*14.2 (B)*
		RT	2.5 (A)		7.7 (A)		3.9 (A)		15.4 (B)	
	EB	LT	31.5 (C)	*22.6 (C)*	31.2 (C)	*23.3 (C)*	33.8 (C)	*28.1 (C)*	102.9 (F)	*90.6 (F)*
		RT	3.3 (A)		3.8 (A)		8 (A)		55.7 (E)	
	Intersection		***7 (A)***		***8.2 (A)***		***8.1 (A)***		***23.7 (C)***	
Potomac Avenue and Swann Avenue	NB	LT	5 (A)	*4.6 (A)*	11.8 (B)	*5.1 (A)*	5.3 (A)	*4.6 (A)*	12.7 (B)	*5.3 (A)*
		TH	4.6 (A)		4.6 (A)		4.6 (A)		4.9 (A)	
	SB	TH	7.2 (A)	*8 (A)*	7.7 (A)	*7.8 (A)*	8.7 (A)	*9.6 (A)*	6.6 (A)	*6.7 (A)*
		RT	8.9 (A)		8.4 (A)		10.7 (B)		7.2 (A)	
	EB	LT	36.8 (D)	*37.2 (D)*	42.3 (D)	*44.9 (D)*	36.4 (D)	*37.6 (D)*	42.3 (D)	*45 (D)*
		RT	39.3 (D)		46.3 (D)		42.7 (D)		46.5 (D)	
	Intersection		***7.4 (A)***		***11.1 (B)***		***7.5 (A)***		***9.9 (A)***	

Table 6-1: Phase I Intersection Capacity Analyses – Delay (LOS) (seconds/vehicle))										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
Potomac Avenue and E. Custis Avenue	NB	U-Turn	0 (A)	*4.1 (A)*	0 (A)	*4.1 (A)*	0 (A)	*3.5 (A)*	0 (A)	*3.8 (A)*
		LT	1.7 (A)		14.3 (B)		3.2 (A)		13.4 (B)	
		TH	4.1 (A)		3.6 (A)		3.5 (A)		3.4 (A)	
	SB	TH	4 (A)	*3.9 (A)*	4.5 (A)	*4.5 (A)*	4.3 (A)	*4 (A)*	4.1 (A)	*4.1 (A)*
		RT	3 (A)		4.4 (A)		2.3 (A)		4.3 (A)	
	EB	LT	40.8 (D)	*39.9 (D)*	38.6 (D)	*38.6 (D)*	39.1 (D)	*38.9 (D)*	38.6 (D)	*38.6 (D)*
		RT	20.6 (C)		0 (A)		30.3 (C)		0 (A)	
	Intersection		***5.5 (A)***		***5 (A)***		***5.7 (A)***		***4.7 (A)***	
Potomac Avenue and E. Howell Avenue	NB	U-Turn	0 (A)	*2.4 (A)*	12.9 (B)	*2.5 (A)*	0 (A)	*3.5 (A)*	16 (B)	*3.9 (A)*
		LT	3.1 (A)		8.5 (A)		4.2 (A)		8.9 (A)	
		TH	2.4 (A)		2.3 (A)		3.5 (A)		3.8 (A)	
	SB	U-Turn	14.7 (B)	*2.6 (A)*	6.2 (A)	*2.4 (A)*	13 (B)	*3.3 (A)*	5.5 (A)	*3.1 (A)*
		TH	1.4 (A)		2.4 (A)		2.5 (A)		3.2 (A)	
		RT	1.9 (A)		2.2 (A)		1.4 (A)		2.3 (A)	
	EB	LT	49.1 (D)	*47.1 (D)*	49.7 (D)	*48.3 (D)*	50.8 (D)	*49.2 (D)*	57.1 (E)	*57.1 (E)*
		RT	43.9 (D)		44 (D)		41 (D)		56.9 (E)	
	Intersection		***3.3 (A)***		***3.8 (A)***		***5.4 (A)***		***7.3 (A)***	
Potomac Avenue and Main Line Boulevard	NB Mainline	LT	32.4 (C)	*31.3 (C)*	49 (D)	*35.1 (D)*	32.2 (C)	*30.7 (C)*	50.6 (D)	*36.1 (D)*
		TH	30.6 (C)		30.6 (C)		30.6 (C)		32.9 (C)	
		RT	30.3 (C)		32.2 (C)		29.3 (C)		32.8 (C)	
	SB Mainline	LT	17.2 (B)	*25.1 (C)*	0 (A)	*27.9 (C)*	21.5 (C)	*24.2 (C)*	0 (A)	*25.8 (C)*
		TH	23.1 (C)		28 (C)		22.3 (C)		26.4 (C)	
		RT	26.1 (C)		27.7 (C)		25 (C)		25.6 (C)	
	EB Potomac	LT	10.6 (B)	*10.2 (B)*	25.1 (C)	*14.4 (B)*	11.8 (B)	*10.9 (B)*	30.7 (C)	*16.5 (B)*
		TH	10.5 (B)		14.6 (B)		11.2 (B)		16.2 (B)	
		RT	8.3 (A)		8.8 (A)		9 (A)		10.3 (B)	
	WB Potomac	LT	40.8 (D)	*15.8 (B)*	41.7 (D)	*24.5 (C)*	43.8 (D)	*18.4 (B)*	41.9 (D)	*30.5 (C)*
		TH	7.5 (A)		19.5 (B)		8.5 (A)		27.5 (C)	
		RT	1.8 (A)		6.9 (A)		12.1 (B)		12.3 (B)	
	Intersection		***16.6 (B)***		***22.4 (C)***		***17.3 (B)***		***26.5 (C)***	
Commonwealth Avenue & West Glebe Road/East Glebe Road*	EB	LTR	*B (16.7)*		*B (14.0)*		*B (17.3)*		*B (14.4)*	
	WB	LTR	*B (11.6)*		*B (17.5)*		*B (11.8)*		*B (18.1)*	
	NB	LTR	*B (14.0)*		*B (13.0)*		*B (14.0)*		*B (13.0)*	
	SB	LTR	*B (14.9)*		*B (15.8)*		*B (14.9)*		*B (15.8)*	
	Intersection		***B (14.8)***		***B (15.7)***		***B (15.1)***		***B (16.1)***	

*Analyzed in Synchro

Table 6-1: Phase I Intersection Capacity Analyses – Delay (LOS) (seconds/vehicle)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue*	WB	LR	*D (52.0)*		*D (51.6)*		*D (51.7)*		*D (51.6)*	
	NB	TL	*C (32.2)*	*C (30.2)*	*C (30.2)*	*C (28.9)*	*C (31.9)*	*C (30.0)*	*C (30.2)*	*C (28.9)*
		R	*C (25.7)*		*C (25.1)*		*C (25.4)*		*C (25.1)*	
	SB	TL	*C (32.4)*	*C (23.5)*	*D (41.3)*	*C (31.9)*	*C (32.1)*	*C (23.2)*	*D (41.3)*	*C (31.9)*
		R	*A (7.8)*		*B (12.3)*		*A (7.6)*		*B (12.3)*	
	NEB	L	*D (37.9)*	*D (47.3)*	*D (44.7)*	*D (47.1)*	*D (37.5)*	*D (46.7)*	*D (44.2)*	*D (46.9)*
		TR	*D (53.1)*		*D (49.0)*		*D (52.3)*		*D (49.0)*	
	SWB	LTR	*D (53.4)*		*F (141.6)*		*D (52.9)*		*F (82.9)*	
	Intersection		***D (39.0)***		***E (59.2)***		***D (38.5)***		***D (45.1)***	
Potomac Avenue and Livingston Avenue	**NB**	**LT**	-	-	-	-	-	*2.2 (A)*	-	*1.6 (A)*
		TH	-		-		2.2 (A)		1.6 (A)	
		RT	-		-		2.2 (A)		1 (A)	
	SB	**LT**	-	*9.4 (A)*	-	*9.2 (A)*	-	*1.2 (A)*	31.5 (D)	*19.9 (C)*
		TH	9.4 (A)		9.2 (A)		6.8 (A)		19.8 (C)	
		RT	10.6 (B)		11 (B)		1.1 (A)		-	
	EB	**LT**	-	*0 (A)*	-	-	-	-	-	-
		TH	-		-		-		-	
		RT	0 (A)		-		-		-	
	WB	**LT**	-	-	-	-	13.7 (B)	*9.8 (A)*	22.2 (C)	*15.1 (C)*
		TH	-		-		-		-	
		RT	-		-		5.9 (A)		6.2 (A)	
	Intersection		***0.7 (A)***		***2 (A)***		***1.9 (A)***		***13.9 (B)***	
Potomac Avenue and Tide Lock Avenue	**NB**	**LT**	-	-	-	-	-	*5.1 (A)*	-	*9.7 (A)*
		TH	-		-		5.1 (A)		9.7 (A)	
		RT	-		-		7.2 (A)		7.5 (A)	
	SB	**LT**	-	*9.4 (A)*	-	*9.2 (A)*	33.3 (C)	*13.9 (B)*	28.7 (C)	*21.4 (C)*
		TH	9.4 (A)		9.2 (A)		13.6 (B)		21.3 (C)	
		RT	10.6 (B)		11 (B)		-		-	
	EB	**LT**	-	*0 (A)*	-	*10 (A)*	-	-	-	-
		TH	-		-		-		-	
		RT	0 (A)		10 (A)		-		-	
	WB	**LT**	-	-	-	-	0 (A)	*34.4 (C)*	35.3 (D)	*34 (C)*
		TH	-		-		-		-	
		RT	-		-		34.4 (C)		33.1 (C)	
	Intersection		***9.4 (A)***		***9.2 (A)***		***7.9 (A)***		***17.8 (B)***	

*Analyzed in Synchro / "-" - intersection or movement not considered in current scenario

Table 6-1: Phase I Intersection Capacity Analyses – Delay (LOS) (seconds/vehicle)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
Potomac Avenue and Silver Meteor Avenue	NB	LT	-	-	-	-	-	*5.2 (A)*	-	*44.6 (D)*
		TH	-		-		5.3 (A)		45.3 (D)	
		RT	-		-		4.1 (A)		41.7 (D)	
	SB	LT	-	*8.9 (A)*	-	*5 (A)*	18.6 (B)	*13.4 (B)*	50.8 (D)	*30.3 (C)*
		TH	8.9 (A)		5 (A)		13.2 (B)		28.2 (C)	
		RT	6.7 (A)		7.1 (A)		-		-	
	EB	LT	-	*0 (A)*	-	*4.8 (A)*	-	-	-	-
		TH	-		-		-		-	
		RT	0 (A)		4.8 (A)		-		-	
	WB	LT	-	-	-	-	4.7 (A)	*7.9 (A)*	69.3 (E)	*68.4 (E)*
		TH	-		-		-		-	
		RT	-		-		10.7 (B)		67.6 (E)	
	Intersection		***8.9 (A)***		***5 (A)***		***7.7 (A)***		***38.4 (D)***	
Potomac Avenue and Evans Lane	NB	LT	7.2 (A)	*3.1 (A)*	14 (B)	*4 (A)*	-	*3.3 (A)*	-	*29.3 (C)*
		TH	3.1 (A)		3.9 (A)		3.3 (A)		29.3 (C)	
		RT	-		-		0 (A)		26.8 (C)	
	SB	LT	-	*14.8 (B)*	-	*7.6 (A)*	-	*16.7 (B)*	-	*10 (A)*
		TH	14.8 (B)		7.6 (A)		40.1 (D)		25.8 (C)	
		RT	7.6 (A)		7.1 (A)		16.2 (B)		9.8 (A)	
	EB	LT	27 (C)	*27 (C)*	29.4 (C)	*19.7 (B)*	0 (A)	*27 (C)*	0 (A)	*46.1 (D)*
		TH	-		-		-		-	
		RT	0 (A)		3.4 (A)		27 (C)		46.1 (D)	
	WB	LT	-	-	-	-	-	-	-	-
		TH	-		-		-		-	
		RT	-		-		-		-	
	Intersection		***6.2 (A)***		***6.6 (A)***		***7.6 (A)***		***16.1 (B)***	
Potomac Avenue and Wesmond Drive	NB	LT	-	-	-	-	0 (A)	*8.9 (A)*	0 (A)	*63.6 (E)*
		TH	-		-		8.8 (A)		63.1 (E)	
		RT	-		-		10.5 (B)		68 (E)	
	SB	LT	-	*8.2 (A)*	-	*5.4 (A)*	26.2 (C)	*16.7 (B)*	15 (B)	*9.1 (A)*
		TH	8.9 (A)		5 (A)		16 (B)		9.1 (A)	
		RT	6.7 (A)		7.1 (A)		0 (A)		0 (A)	
	EB	LT	-	*0 (A)*	-	*0*	0 (A)	*0 (A)*	0 (A)	*0 (A)*
		TH	-		-		0 (A)		0 (A)	
		RT	0 (A)		4.5 (A)	*4.5 (A)*	0 (A)		0 (A)	
	WB	LT	-	-	-	-	28.3 (C)	*28.3 (C)*	38 (D)	*38.6 (D)*
		TH	-		-		0 (A)		0 (A)	
		RT	-		-		0 (A)		51.5 (D)	
	Intersection		***8.2 (A)***		***5.4 (A)***		***11.4 (B)***		***27.8 (C)***	

"-" - intersection or movement not considered in current scenario

Table 6-1: Phase I Intersection Capacity Analyses – Delay (LOS) (seconds/vehicle)						
Intersection	Approach	Mvmt	2010 Plan		Updated Plan	
			AM	PM	AM	PM
Tide Lock Avenue and Livingston Avenue*	**SB**	**LTR**	-	-	*A (7.2)*	*A (7.3)*
	EB	**LTR**	-	-	*A (7.0)*	*A (7.0)*
	WB	**LTR**	-	-	*A (6.6)*	*A (6.7)*
	Intersection		**-**	**-**	***A (6.9)***	***A (6.9)***
Retail Street and E. Reed Avenue*	**NB**	**LTR**	-	-	*A (7.4)*	*A (7.6)*
	SB	**LTR**	-	-	*A (6.7)*	*A (6.8)*
	EB	**LTR**	-	-	*A (7.1)*	*A (7.5)*
	Intersection		**-**	**-**	***A (7.0)***	***A (7.3)***
Retail Street and Silver Meteor Avenue*	**NB**	**LTR**	-	-	*A (7.2)*	*A (7.7)*
	SB	**LTR**	-	-	*A (7.4)*	*A (7.4)*
	EB	**LTR**	-	-	*A (7.3)*	*A (7.5)*
	WB	**LTR**	-	-	*A (7.4)*	*A (7.6)*
	Intersection		**-**	**-**	***A (7.4)***	***A (7.6)***
Retail Street and Evans Lane*	**NB**	**LTR**	-	-	*A (7.2)*	*A (7.4)*
	SB	**LTR**	-	-	*A (7.1)*	*A (7.1)*
	EB	**LTR**	-	-	*A (7.1)*	*A (6.9)*
	WB	**LTR**	-	-	*A (7.1)*	*A (7.2)*
	Intersection		**-**	**-**	***A (7.1)***	***A (7.3)***
Retail Street and Wesmond Drive*	***Intersection***		-	-	*n/a*	*n/a*

"-" - intersection or movement not considered in current scenario

*Analyzed in Synchro

Queuing

The VISSIM reported average and maximum queue results are shown in **Table 6-2**. 95th percentile queuing results are presented for intersections not analyzed in VISSIM.

Along US Route 1, there are locations that experience significant queuing. Significant maximum queuing at key study intersections includes:

- Eastbound approach of the intersection of US Route 1 and E Glebe Road
- Westbound approach of the intersection of US Route 1 and Potomac Avenue
- Southbound and eastbound approaches of the intersection of US Route 1 and E. Reed Avenue
- Northbound approach of the intersection of US Route 1 and Slaters Lane.

Vehicle queues at these key intersections have the potential to spill back to upstream intersections and negatively impact traffic operations. Along Potomac Avenue, vehicle queuing is generally not an issue. Average and maximum approach and turn lane queues are generally contained within block lengths and storage lengths at intersections in the vicinity of the site.

Table 6-2: Phase I Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
US Route 1 and S. Glebe Road	NB	LT	535	141 (467)	107 (340)	148 (472)	107 (350)
		TH	830	78 (497)	75 (272)	92 (561)	80 (309)
		RT	360	92 (523)	88 (298)	106 (588)	94 (335)
	SB	LT	310	70 (306)	89 (609)	89 (345)	128 (863)
		TH	895	90 (363)	564 (935)	94 (364)	588 (939)
		RT	320	7 (120)	231 (980)	7 (111)	207 (981)
	EB	LT	500	140 (477)	868 (1074)	142 (493)	940 (1077)
		TH	500	140 (477)	868 (1074)	142 (493)	940 (1077)
		RT		25 (240)	962 (1111)	28 (235)	1002 (1114)
	WB	LT	175	10 (87)	20 (128)	10 (78)	22 (138)
		TH	555	59 (220)	47 (167)	60 (208)	49 (182)
		RT	160	18 (178)	4 (74)	22 (201)	6 (93)
US Route 1 and Potomac Yard Driveway opposite Alexandria Toyota	NB	U-Turn	240	20 (119)	15 (103)	21 (132)	15 (96)
		LT		20 (119)	15 (103)	21 (132)	15 (96)
		TH	445	18 (280)	62 (334)	18 (263)	62 (335)
		RT		22 (306)	73 (360)	23 (289)	72 (362)
	SB	LT	250	15 (140)	118 (660)	17 (147)	123 (664)
		TH	830	28 (284)	128 (754)	31 (290)	148 (778)
		RT		36 (314)	143 (784)	39 (320)	163 (809)
	EB	LT	375	30 (156)	80 (365)	29 (155)	84 (373)
		TH		30 (156)	80 (365)	29 (155)	84 (373)
		RT		45 (181)	99 (390)	44 (181)	103 (398)
	WB	LT	275	9 (92)	17 (129)	13 (98)	17 (129)
		TH		9 (92)	17 (129)	13 (98)	17 (129)
		RT	350	6 (96)	6 (87)	9 (119)	6 (88)
US Route 1 and Luna Park Drive	NB	LT	95	0 (43)	4 (66)	0 (52)	4 (71)
		TH	395	9 (210)	4 (120)	9 (160)	4 (119)
	SB	TH	465	15 (211)	188 (584)	16 (237)	170 (552)
		RT		20 (247)	208 (624)	21 (277)	188 (592)
	EB	LT	150	36 (167)	11 (85)	36 (167)	10 (82)
		RT		1 (41)	1 (53)	1 (41)	1 (48)

Table 6-2: Phase I Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
US Route 1 and E. Reed Avenue	NB	U-Turn	210	3 (180)	27 (364)	2 (166)	24 (377)
		LT		7 (222)	50 (407)	6 (209)	45 (420)
		TH	830	74 (544)	42 (513)	86 (549)	46 (506)
		RT	140	0 (22)	0 (24)	0 (13)	0 (24)
	SB	U-Turn	100	19 (157)	28 (269)	39 (205)	54 (444)
		LT		19 (157)	28 (269)	39 (205)	54 (444)
		TH	500	36 (450)	274 (534)	35 (396)	250 (539)
		RT		3 (114)	42 (503)	3 (157)	43 (483)
	EB	LT	1550	106 (485)	43 (241)	111 (496)	48 (251)
		TH		10 (194)	24 (207)	27 (411)	31 (252)
		RT	630	12 (196)	28 (208)	29 (412)	34 (253)
	WB	LT	120	24 (125)	85 (326)	21 (124)	78 (284)
		TH	740	2 (59)	4 (91)	5 (65)	14 (249)
		RT		5 (82)	15 (238)	6 (90)	14 (211)
US Route 1 and Montrose Avenue	NB	LT	120	6 (260)	17 (258)	5 (295)	16 (224)
		TH	340	25 (317)	11 (240)	24 (314)	11 (235)
	SB	TH	580	8 (193)	205 (585)	8 (187)	209 (586)
		RT		8 (193)	227 (619)	8 (187)	232 (619)
	EB	LT	900	96 (288)	106 (276)	96 (288)	97 (275)
		RT		88 (278)	96 (266)	88 (278)	87 (265)
US Route 1 and Evans Lane	NB	U-Turn	130	0 (18)	0 (28)	0 (15)	0 (27)
		LT		0 (18)	0 (28)	0 (15)	0 (27)
		TH	780	19 (577)	16 (278)	13 (565)	13 (208)
		RT	180	0 (36)	0 (56)	0 (37)	0 (47)
	SB	U-Turn	130	0 (24)	3 (81)	0 (29)	2 (59)
		LT		0 (24)	3 (81)	0 (29)	2 (59)
		TH	270	3 (148)	232 (333)	2 (109)	236 (331)
		RT	40	4 (156)	239 (341)	3 (117)	243 (339)
	EB	LT	280	12 (114)	12 (124)	12 (114)	12 (116)
		TH		12 (114)	12 (124)	12 (114)	12 (116)
		RT		16 (125)	16 (134)	16 (125)	17 (127)
	WB	LT	130	29 (149)	77 (322)	22 (139)	75 (315)
		TH	360	29 (149)	77 (322)	22 (139)	75 (315)
		RT		24 (144)	58 (321)	24 (126)	58 (314)

Table 6-2: Phase I Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
US Route 1 and E. Glebe Road	NB	U-Turn	350	29 (192)	83 (312)	29 (185)	75 (316)
		LT	350	29 (192)	83 (312)	29 (185)	75 (316)
		TH	1120	93 (324)	94 (319)	86 (320)	99 (327)
		RT		93 (324)	94 (319)	86 (320)	99 (327)
	SB	U-Turn	280	68 (324)	47 (271)	70 (295)	84 (550)
		LT		68 (324)	47 (271)	70 (295)	84 (550)
		TH	860	90 (508)	415 (905)	90 (509)	436 (907)
		RT		91 (512)	418 (909)	91 (513)	439 (911)
	EB	LT	660	48 (246)	21 (159)	48 (246)	21 (164)
		TH		45 (250)	22 (177)	49 (248)	36 (203)
		RT		8 (118)	19 (158)	7 (137)	19 (183)
	WB	LT	930	13 (113)	16 (133)	37 (259)	52 (309)
		TH		52 (274)	91 (328)	53 (301)	111 (350)
		RT	100	56 (276)	93 (330)	55 (304)	113 (352)
US Route 1 and Swann Avenue	NB	U-Turn	140	55 (386)	171 (395)	54 (381)	164 (405)
		LT		55 (386)	171 (395)	54 (381)	164 (405)
		TH	1200	142 (388)	109 (390)	131 (382)	115 (397)
		RT		145 (392)	111 (394)	133 (386)	117 (401)
	SB	U-Turn	190	34 (232)	29 (158)	37 (236)	28 (169)
		LT		34 (232)	29 (158)	37 (236)	28 (169)
		TH	1130	92 (348)	73 (340)	91 (355)	85 (344)
		RT		92 (348)	74 (344)	91 (355)	86 (347)
	EB	LT	150	58 (313)	55 (311)	60 (319)	57 (302)
		TH		31 (256)	23 (187)	31 (275)	22 (185)
		RT		33 (258)	26 (188)	34 (276)	25 (187)
	WB	LT	740	36 (228)	48 (258)	36 (223)	49 (253)
		TH		23 (179)	26 (240)	23 (185)	30 (239)
		RT		28 (187)	30 (247)	28 (192)	34 (247)
US Route 1 and Fannon Street	SB	TH	470	6 (157)	18 (191)	6 (168)	18 (190)
		RT		6 (157)	18 (191)	6 (168)	18 (190)
	EB	RT	300	2 (58)	2 (61)	2 (57)	2 (61)

Table 6-2: Phase I Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	**PM**	**AM**	**PM**
US Route 1 and E. Custis Avenue	NB	U-Turn	130	12 (77)	18 (130)	12 (76)	18 (129)
		LT		12 (77)	18 (130)	12 (76)	18 (129)
		TH	550	81 (304)	28 (242)	70 (302)	41 (277)
		RT		83 (308)	29 (246)	71 (306)	42 (280)
	SB	U-Turn	150	5 (49)	10 (80)	5 (52)	10 (76)
		LT		5 (49)	10 (80)	5 (52)	10 (76)
		TH	1190	34 (334)	46 (517)	35 (345)	45 (507)
		RT		36 (339)	48 (522)	37 (350)	47 (512)
	EB	LT	2290	69 (295)	64 (276)	75 (303)	75 (315)
		TH		69 (295)	64 (276)	75 (303)	75 (315)
		RT		73 (298)	68 (279)	79 (306)	78 (318)
	WB	LT	760	27 (165)	72 (238)	27 (167)	83 (238)
		TH		27 (165)	72 (238)	27 (167)	83 (238)
		RT		33 (174)	80 (247)	33 (177)	91 (248)
US Route 1 and E. Howell Avenue	NB	U-Turn	140	27 (190)	79 (271)	28 (226)	87 (292)
		LT		27 (190)	79 (271)	28 (226)	87 (292)
		TH	800	69 (294)	28 (240)	65 (295)	39 (287)
		RT		74 (304)	31 (251)	69 (306)	43 (298)
	SB	U-Turn	130	8 (72)	4 (53)	8 (76)	4 (55)
		LT		8 (72)	4 (53)	8 (76)	4 (55)
		TH	540	38 (254)	44 (258)	38 (254)	52 (261)
		RT		42 (267)	50 (271)	42 (267)	58 (274)
	EB	LT	2270	45 (219)	104 (394)	48 (233)	111 (421)
		TH		45 (219)	104 (394)	48 (233)	111 (421)
		RT		45 (219)	104 (394)	48 (233)	111 (421)
	WB	LT	600	11 (86)	76 (233)	12 (91)	90 (233)
		TH		11 (86)	76 (233)	12 (91)	90 (233)
		RT		3 (43)	2 (38)	3 (45)	2 (38)
US Route 1 and Potomac Avenue	NB	TH	990	254 (1096)	61 (631)	298 (1092)	100 (828)
		RT	140	170 (1033)	0 (75)	205 (1037)	1 (135)
	SB	TH	740	36 (416)	55 (447)	37 (394)	59 (447)
	WB	LT	280	84 (298)	145 (348)	83 (288)	165 (358)
		RT	190	95 (312)	155 (362)	93 (303)	176 (373)

Table 6-2: Phase I Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
US Route 1 and Slaters Lane	NB	TH	1340	508 (1248)	40 (512)	549 (1252)	63 (682)
		RT	1040	125 (1252)	25 (457)	62 (1148)	34 (532)
	SB	LT	590	65 (397)	69 (677)	62 (410)	87 (734)
		TH	1060	10 (291)	9 (421)	12 (341)	11 (422)
	WB	RT	400	51 (335)	3 (121)	61 (375)	7 (189)
Potomac Avenue and E. Reed Avenue	NB	LT	245	4 (178)	43 (347)	13 (265)	169 (419)
		TH		4 (178)	43 (347)	13 (265)	169 (419)
		RT		2 (157)	34 (325)	9 (243)	153 (397)
	SB	LT	235	18 (222)	9 (123)	57 (420)	104 (431)
		TH		18 (222)	9 (123)	57 (420)	104 (431)
		RT		28 (260)	15 (148)	72 (458)	120 (457)
	EB	LT	215	3 (42)	3 (58)	2 (47)	3 (54)
		TH		0 (0)	1 (66)	8 (98)	24 (236)
		RT		0 (27)	4 (80)	12 (115)	33 (250)
	WB	LT	215	0 (0)	0 (0)	8 (105)	16 (170)
		TH		0 (0)	0 (0)	8 (105)	16 (170)
		RT		0 (44)	0 (44)	12 (120)	21 (186)
Potomac Avenue and E. Glebe Road	NB	LT	110	1 (41)	1 (39)	1 (39)	3 (60)
		TH	1150	22 (262)	7 (103)	21 (222)	34 (231)
	SB	TH	1700	3 (97)	23 (281)	7 (140)	72 (500)
		RT		1 (89)	19 (273)	4 (133)	67 (493)
	EB	LT	860	22 (210)	27 (211)	37 (276)	117 (429)
		RT		25 (217)	30 (218)	41 (284)	122 (437)
Potomac Avenue and Swann Avenue	NB	LT	110	1 (48)	0 (39)	1 (42)	0 (42)
		TH	1090	14 (237)	5 (126)	14 (224)	7 (195)
	SB	TH	1120	9 (174)	25 (216)	12 (209)	23 (236)
		RT		9 (174)	25 (216)	12 (209)	23 (236)
	EB	LT	820	18 (141)	41 (249)	17 (141)	41 (250)
		RT		21 (144)	45 (252)	19 (143)	45 (252)
Potomac Avenue and E. Custis Avenue	NB	U-Turn	140	508 (1248)	40 (512)	549 (1252)	63 (682)
		LT		125 (1252)	25 (457)	62 (1148)	34 (532)
		TH	720	65 (397)	69 (677)	62 (410)	87 (734)
	SB	TH	1200	10 (291)	9 (421)	12 (341)	11 (422)
		RT		51 (335)	3 (121)	61 (375)	7 (189)
	EB	LT	850	4 (178)	43 (347)	13 (265)	169 (419)
		RT		4 (178)	43 (347)	13 (265)	169 (419)

Table 6-2: Phase I Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
Potomac Avenue and E. Howell Avenue	NB	U-Turn	150	3 (169)	2 (75)	6 (168)	3 (104)
		LT		3 (169)	2 (75)	6 (168)	3 (104)
		TH	800	3 (169)	2 (75)	6 (168)	3 (104)
	SB	U-Turn	540	0 (49)	2 (94)	1 (67)	2 (99)
		TH		0 (49)	2 (94)	1 (67)	2 (99)
		RT		0 (49)	2 (94)	1 (67)	2 (99)
	EB	LT	710	3 (46)	9 (91)	11 (93)	33 (198)
		RT		5 (51)	11 (96)	13 (98)	36 (203)
Potomac Avenue and Main Line Boulevard	NB	LT	730	38 (237)	8 (117)	39 (256)	9 (143)
		TH		45 (249)	27 (171)	48 (273)	32 (191)
		RT		45 (249)	27 (171)	48 (273)	32 (191)
	SB	LT	700	15 (136)	6 (80)	14 (133)	3 (48)
		TH		15 (136)	6 (80)	14 (133)	3 (48)
		RT		15 (136)	6 (80)	14 (133)	3 (48)
	EB	LT	310	50 (318)	30 (295)	54 (314)	36 (305)
		TH		50 (318)	30 (295)	54 (314)	36 (305)
		RT		44 (306)	24 (283)	48 (302)	29 (292)
	WB	LT	300	0 (0)	0 (49)	0 (2)	0 (39)
		TH		3 (82)	43 (400)	4 (103)	70 (473)
		RT		7 (130)	60 (448)	8 (151)	90 (521)
Commonwealth Avenue & West Glebe Road/East Glebe Road*	NB	LTR	200	41	24	41	24
	SB	LTR	350	67	85	67	85
	EB	LTR	425	179	131	187	139
	WB	LTR	225	79	185	82	195
Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue*	NB	T	175	214	174	212	174
		R		21	0	22	0
	NEB	L	200	206	122	201	114
		T	200	#369	148	#365	148
	SB	T	525	183	298	182	298
		R	250	17	19	17	19
	SWB	T	50	179	#410	173	#336
	WB	L	625	0	0	0	0

*Analyzed in synchro

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 6-2: Phase I Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
Potomac Avenue and Livingston Avenue	NB	LT	300**	- (-)	- (-)	- (-)	- (-)
		TH		- (-)	- (-)	10 (199)	1 (130)
		RT		- (-)	- (-)	7 (164)	0 (78)
	SB	LT	300**	- (-)	- (-)	1 (58)	102 (616)
		TH		0 (31)	0 (62)	1 (58)	102 (616)
		RT		0 (31)	0 (62)	- (-)	- (-)
	EB	LT	700**	- (-)	- (-)	- (-)	- (-)
		TH		- (-)	- (-)	- (-)	- (-)
		RT		0 (12)	0 (10)	- (-)	- (-)
	WB	LT	200**	- (-)	- (-)	1 (41)	1 (41)
		TH		- (-)	- (-)	- (-)	- (-)
		RT		- (-)	- (-)	1 (52)	0 (52)
Potomac Avenue and Tide Lock Avenue	NB	LT	325**	- (-)	- (-)	- (-)	- (-)
		TH		- (-)	- (-)	20 (249)	32 (364)
		RT		- (-)	- (-)	25 (266)	40 (396)
	SB	LT	300**	- (-)	- (-)	40 (304)	89 (371)
		TH		23 (253)	32 (282)	40 (304)	89 (371)
		RT		17 (234)	25 (264)	- (-)	- (-)
	EB	LT	700**	- (-)	- (-)	- (-)	- (-)
		TH		- (-)	- (-)	- (-)	- (-)
		RT		1 (24)	1 (28)	- (-)	- (-)
	WB	LT	325**	- (-)	- (-)	1 (77)	5 (92)
		TH		- (-)	- (-)	- (-)	- (-)
		RT		- (-)	- (-)	- (-)	5 (92)
Potomac Avenue and Silver Meteor Avenue	NB	LT	400**	- (-)	- (-)	- (-)	- (-)
		TH		- (-)	- (-)	- (-)	186 (520)
		RT		- (-)	- (-)	11 (184)	170 (495)
	SB	LT	325**	- (-)	- (-)	41 (411)	162 (444)
		TH		22 (319)	17 (241)	41 (411)	162 (444)
		RT		13 (286)	6 (208)	- (-)	- (-)
	EB	LT	700**	- (-)	- (-)	- (-)	- (-)
		TH		0 (0)	- (-)	0 (0)	- (-)
		RT		0 (0)	2 (46)	- (-)	- (-)
	WB	LT	125**	- (-)	- (-)	1 (119)	84 (202)
		TH		- (-)	- (-)	- (-)	- (-)
		RT		- (-)	- (-)	3 (113)	85 (203)

**Assumed Block and storage length for new intersections

"-" - intersection or movement not considered in current scenario

Table 6-2: Phase I Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
Potomac Avenue and Evans Lane	NB	LT	325**	5 (178)	9 (150)	6 (184)	110 (406)
		TH		5 (178)	9 (150)	8 (212)	126 (438)
		RT		- (-)	- (-)	- (-)	- (-)
	SB	LT	400**	- (-)	- (-)	- (-)	- (-)
		TH		42 (394)	28 (237)	58 (480)	39 (314)
		RT		38 (385)	24 (228)	58 (480)	39 (314)
	EB	LT	700**	1 (24)	1 (30)	0 (36)	0 (4)
		TH		- (-)	- (-)	- (-)	- (-)
		RT		0 (16)	2 (61)	2 (49)	2 (28)
	WB	LT	125**	- (-)	- (-)	- (-)	- (-)
		TH		- (-)	- (-)	- (-)	- (-)
		RT		- (-)	- (-)	- (-)	- (-)
Potomac Avenue and Wesmond Drive	NB	LT	425**	- (-)	- (-)	34 (324)	205 (502)
		TH		- (-)	- (-)	34 (324)	205 (502)
		RT		- (-)	- (-)	34 (324)	205 (502)
	SB	LT	350**	- (-)	- (-)	60 (440)	32 (328)
		TH		21 (292)	18 (151)	60 (440)	32 (328)
		RT		30 (330)	29 (187)	75 (477)	45 (364)
	EB	LT	775**	- (-)	- (-)	0 (0)	0 (0)
		TH		- (-)	- (-)	0 (0)	0 (0)
		RT		1 (42)	3 (54)	0 (0)	0 (0)
	WB	LT	100**	- (-)	- (-)	3 (86)	14 (179)
		TH		- (-)	- (-)	3 (86)	14 (179)
		RT		- (-)	- (-)	4 (90)	16 (183)
Tide Lock Avenue and Livingston Avenue*	SB	LTR	300**	-	-	0	0
	EB	LTR	225**	-	-	0	3
	WB	LTR	350**	-	-	0	0
Retail Street and E. Red Avenue*	NB	LTR	325**	-	-	0	5
	SB	LTR	200**	-	-	8	5
	EB	LTR	125**	-	-	3	5
Retail Street and Silver Meteor Avenue*	NB	LTR	400**	-	-	0	10
	SB	LTR	325**	-	-	5	3
	EB	LTR	125**	-	-	3	5
	WB	LTR	150**	-	-	5	5
Retail Street and Evans Lane*	NB	LTR	175**	-	-	3	10
	SB	LTR	400**	-	-	3	0
	EB	LTR	125**	-	-	0	3
	WB	LTR	575**	-	-	0	0
Retail Street and Wesmond Drive			n/a				

"-" - intersection or movement not considered in current scenario/ *Analyzed in synchro
**Assumed Block and storage length for new intersections

Travel Time

Travel time field simulation results are presented in **Table 6-3**. Travel time is generally consistent for US Route 1 and Potomac Avenue for both directions of travel. The travel time results indicate that the Updated Plan will generally be similar to the 2010 Plan. Under the Updated Plan, there is a greater amount of travel time along Potomac Avenue, particularly in the off-peak direction, due to the single travel lane and the additional turning movements not considered in the 2010 Plan.

Table 6-3: Phase I Travel Time (minutes)

Location / Direction	2010 Plan		Updated Plan	
	AM	PM	AM	PM
US Route 1 Northbound	4.3	4.1	4.2	4.4
US Route 1 Southbound	3.9	5.7	3.9	5.9
Potomac Avenue Northbound	4.3	4.7	4.3	7.4
Potomac Avenue Southbound	5.7	5.4	6.2	6.8

6.7 2021 PHASE I CONDITIONS SUMMARY

With the addition of traffic generated by Phase I of the Updated Plan for North Potomac Yard, the results indicate that generally all intersections will operate at acceptable LOS D or better and the plan will result in traffic impacts that are similar to those of the 2010 Plan. It is recognized that interjurisdictional cooperation would be needed to address the traffic impacts at the intersection of S. Glebe Road and US Route 1. The goal of this cooperation would be to prevent the intersection from becoming a bottleneck along US Route 1 and maintaining the desired progression of traffic in both Arlington County and the City.

There are several intersections approaching capacity or that have high side street approach delays. It is recommended that for the area to continue to accommodate increases in development and to maintain an adequately functioning transportation network, measures to increase non-auto mode share, along with strategic vehicle capacity-enhancing modifications to area streets and intersections will need to be implemented. It is also recommended that traffic signal timing adjustments be considered, in conjunction with other improvements, to provide the desired level of through vehicle progression while serving side streets and pedestrian crossing movements.

7. Analysis of 2040 Full Build-Out Conditions

7.1 OVERVIEW

This chapter examines the multimodal transportation impacts for the 2040 full build-out conditions with the inclusion of traffic generated by North Potomac Yard. Included are descriptions of the future transportation network, future traffic volumes, and future traffic impacts with respect to delay, queuing, and travel time. Both the 2010 Plan and the Updated Plan were analyzed.

7.2 STREET NETWORK

The 2040 full build-out street network is generally the same as the 2021 Phase I conditions, with the exception of any additional planned or programmed transportation improvements (as described in **Chapter 4**). The street network will be further expanded to include the full development of North Potomac Yard, replacing the remaining existing development within North Potomac Yard. The full build-out of the Updated Plan considers an additional signalized intersection along Potomac Avenue (at Livingston Avenue) and four new right-in, right-out streets along US Route 1 (Wesmond Drive, Silver Meteor Avenue, Tide Lock Avenue, and Livingston Avenue). The Updated Plan also considers the extension of Main Line Boulevard from E. Glebe Road to Livingston Avenue. Site intersections along Main Line Boulevard will generally be unsignalized with the exception of the intersection of Evans Lane and Main Line Boulevard. This intersection is signalized to accommodate buses. The full build-out concept for the Updated Plan was previously shown as **Figure 2-3.**

Potomac Avenue in the vicinity of the site will be widened to its ultimate width to support vehicle traffic and dedicated traffic lanes. For the purposes of this study, the street was assumed to operate with two lanes of general traffic in each direction, left-turn lanes at intersections, and dedicated center lanes for transit. It is noted that the City's long-term transportation goal for Potomac Avenue is to develop a multimodal urban street that prioritizes pedestrians, bikes, transit, and cars, in that order. The City desires the Metroway to be integrated in a manner so as to maintain urban scale streets, walkability, and cycling. Further, the City envisions the minimum width necessary to accommodate planned multimodal functions of the street including reasonable pedestrian crossing distances.

It is noted the Updated Plan differs from the 2010 Plan, which considered the relocation of Potomac Avenue such that it would become the easternmost street in the area. This difference is reflected in the analysis of the two plans.

The 2040 full build-out conditions study intersections and lane configurations that were analyzed in this study are shown on **Figure 7-1** and **Figure 7-2**, for the 2010 Plan and Updated Plan, respectively. It is noted that these analyses include the recommended lane improvement at the intersection of US Route 1 and Potomac Avenue (i.e. allowing westbound left turn out of three lanes instead of two).

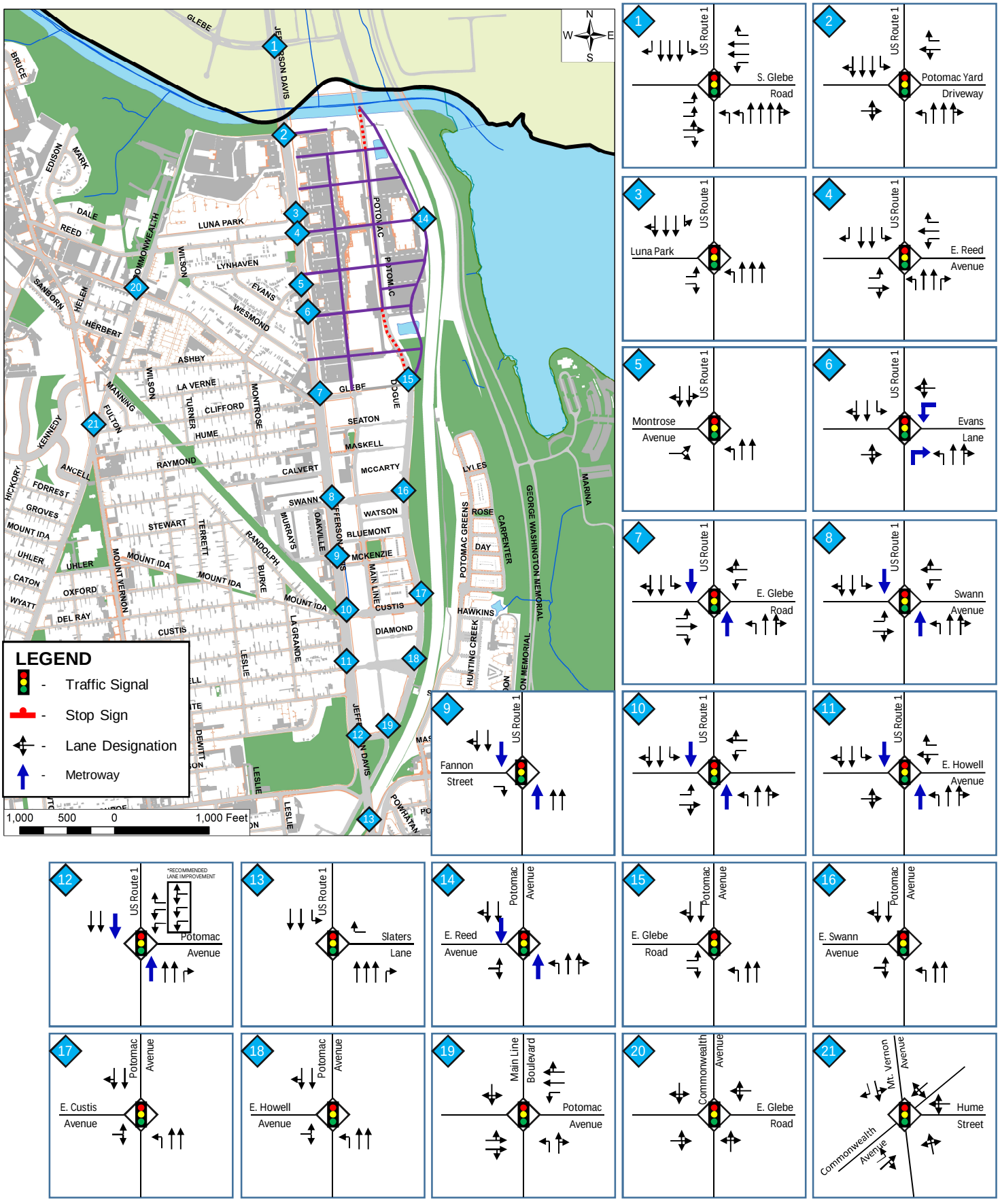
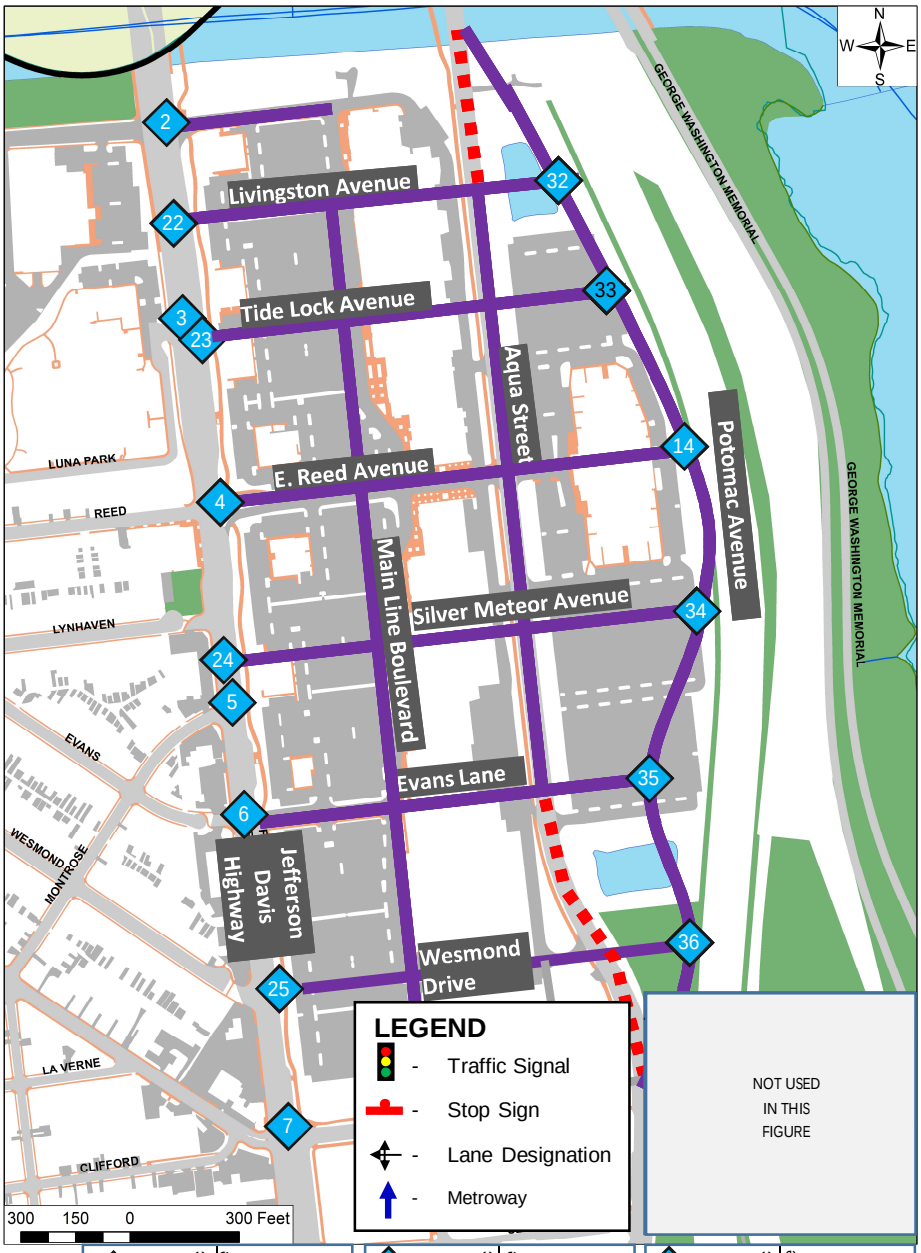


Figure 7-1: Full Build-Out Study Intersections and Lane Designations (2010 Plan) Sheet 1 of 2



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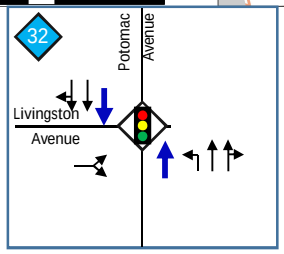

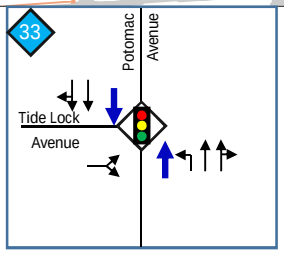

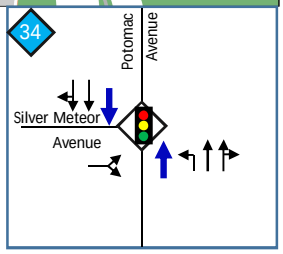

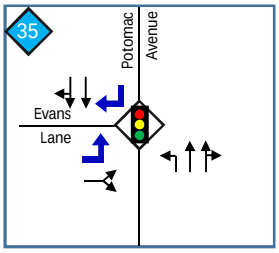

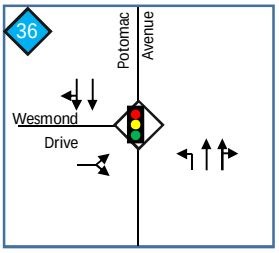

Figure 7-1: Full Build-Out Study Intersections and Lane Designations (2010 Plan) Sheet 2 of 2

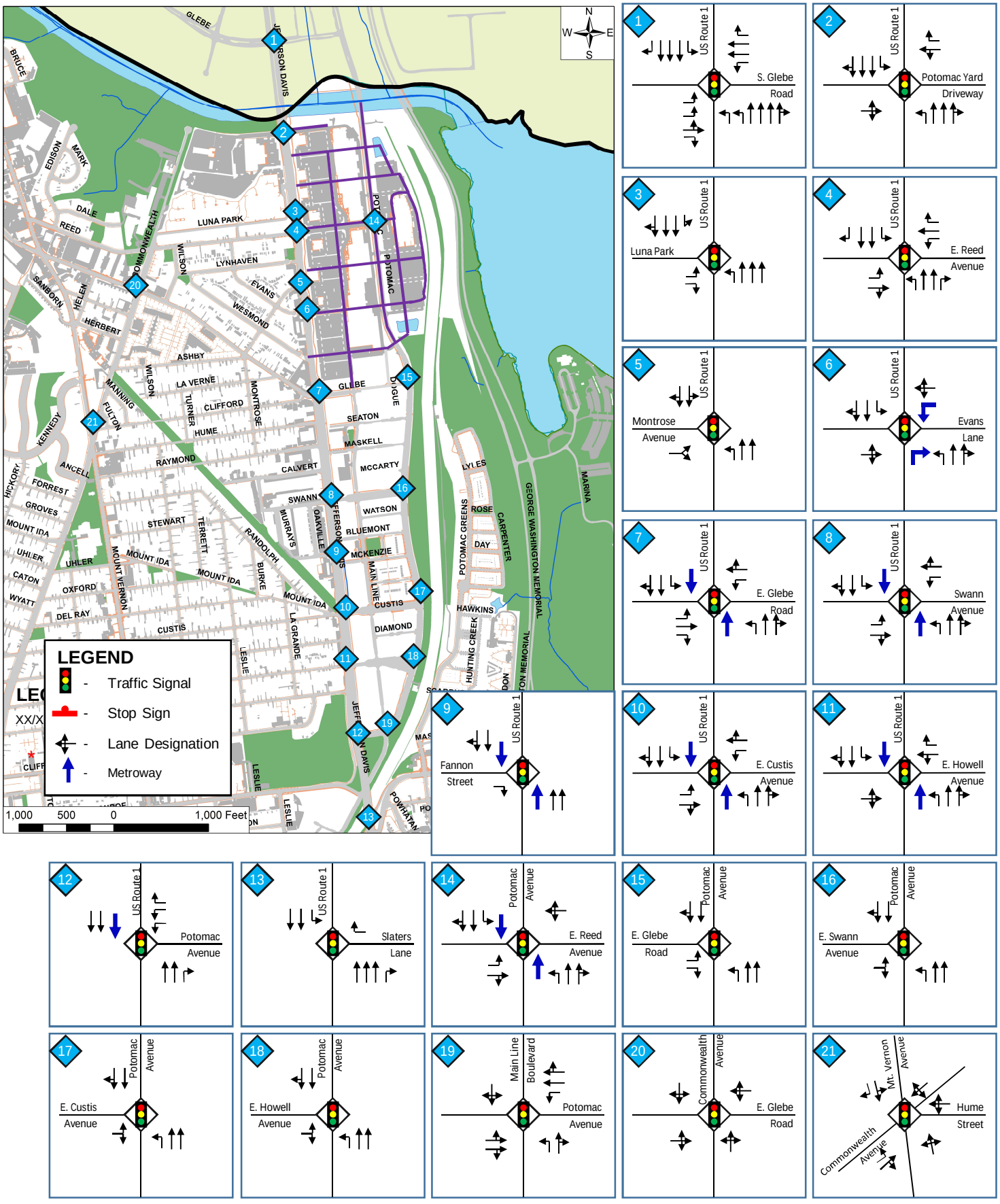

Figure 7-2: Full Build-Out Study Intersections and Lane Designations (Updated Plan) Sheet 1 of 2

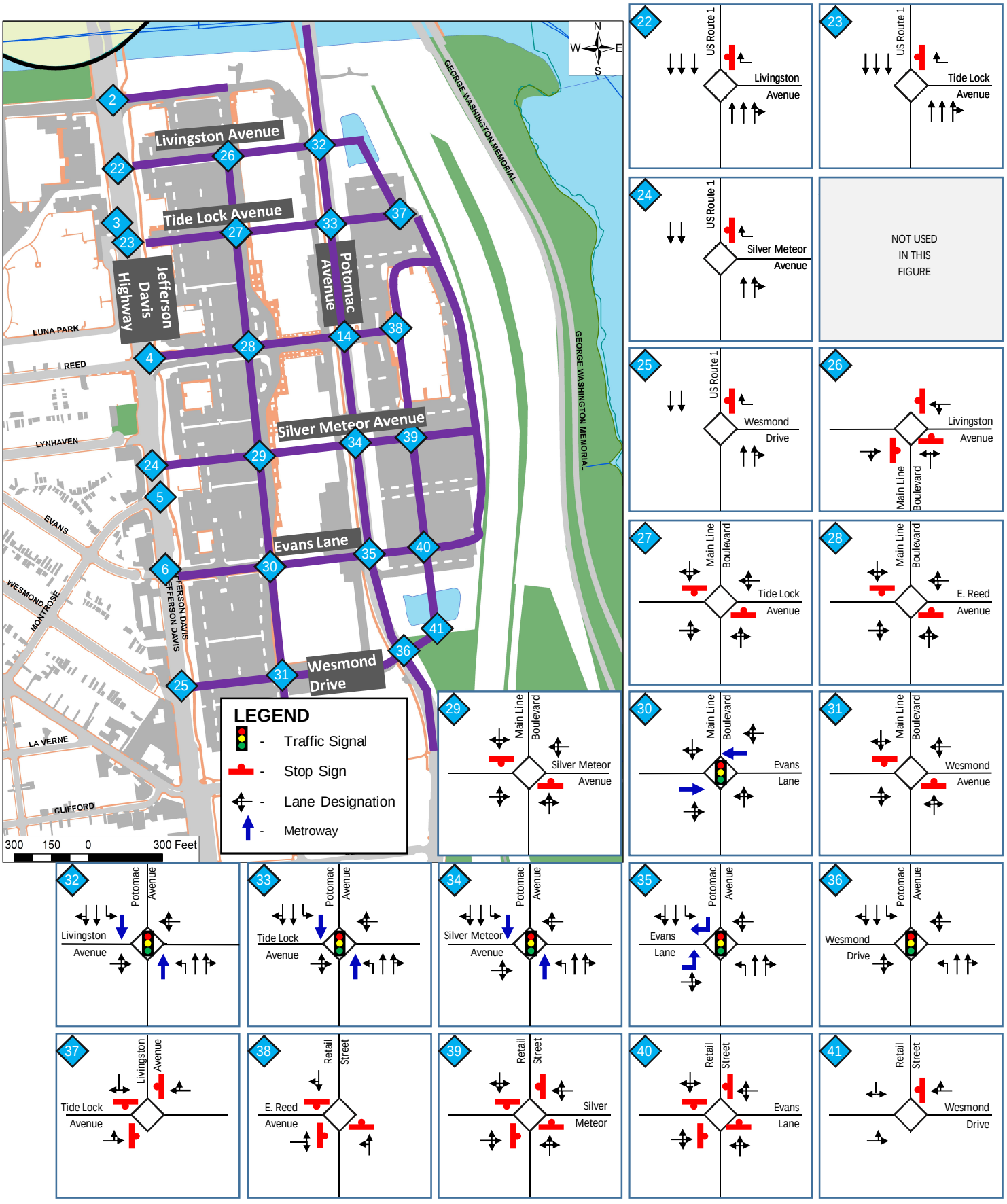

Figure 7-2: Full Build-Out Study Intersections and Lane Designations (Updated Plan) Sheet 2 of 2

7.3 TRANSIT NETWORK

The 2040 full build-out transit network is generally the same as the existing conditions, with the exception of any planned or programmed transportation improvements (as described in **Chapter 4**).

For 2040 full build-out conditions, the dedicated alignment of the Metroway will be extended. Dedicated lanes will continue north from E. Glebe Road, continue east through the site, and then continue north along Potomac Avenue. For the purposes of this study, it was assumed that the east-west dedicated transit lanes through the site were located on Evans Lane. In order to accommodate this design, a traffic signal was proposed at the intersection of Main Line Boulevard and Evans Lane. The signal was assumed to have a concurrent phase operation in this study.

The final location and design of the Metroway dedicated alignment through the site and along Potomac Avenue and the operation of traffic signals will be determined at a later date. It is also anticipated that bus routes may be updated or added to provide service for portions of North Potomac Yard between US Route 1 and Potomac Avenue.

7.4 BICYCLE AND PEDESTRIAN MOBILITY

The 2040 full build-out bicycle and pedestrian network is generally the same as 2021 Phase I conditions, with the exception of any additional planned or programmed transportation improvements (as described in **Chapter 4**) or any development specific frontage improvements. Four Mile Run Trail will be extended east of US Route 1 to ultimately connect with the Mt. Vernon Trail. North Potomac Yard will continue to support pedestrian and bicycle mobility through the provision of on-street bicycle facilities along certain primary streets and the provision of off-street paths and trails. Signalized intersections will be provided at regular intervals to facilitate safe and accessible crossings of Potomac Avenue. A pedestrian actuated traffic signal will be implemented to improve Potomac Avenue crossings north of Livingston Avenue. Further, additional measures will be considered to enhance the pedestrian experience and "knit" the two phases of development, minimizing the potential of Potomac Avenue to act as barrier for travel between the developments to the east and west of Potomac Avenue. Potomac Avenue will be designed to support enhanced bike facilities and east-west bike facilities on the new streets will link Potomac Avenue to the linear trail.

7.5 2040 FULL BUILD-OUT TRAFFIC VOLUMES

2010 Plan

Full build-out peak hour traffic volumes for the 2010 Plan were developed by adding the 2040 background traffic volumes (**Figure 4-5**) to the full build-out site trips for the 2010 Plan (**Figure 5-6**) with consideration for the trip credit for existing uses that will be replaced. Forecasted traffic was adjusted between US Route 1 and Potomac Avenue, as appropriate, to achieve an appropriate balance between the two streets. Specifically, approximately 10 percent of peak hour, peak direction trips (approximately 200 vehicles) along US Route 1 were shifted to Potomac Avenue. This shift occurred at the intersection of Potomac Avenue and US Route 1 for northbound traffic and north of the intersection of S. Glebe Road and US Route 1 for southbound traffic. Volume adjustments are shown in **Appendix J**. The resulting full build-out peak hour traffic volumes for the 2010 Plan are shown in **Figure 7-3**.

Updated Plan

Full build-out peak hour traffic volumes for the Updated Plan were developed by adding the 2040 background traffic volumes (**Figure 4-5**) to the full build-out site trips for the Updated Plan (**Figure 5-7**) with consideration for the trip credit for existing uses that will be replaced. Forecasted traffic was adjusted between US Route 1 and Potomac Avenue, as appropriate, to achieve an appropriate balance between the two streets. Specifically, approximately 10 percent of peak hour, peak direction trips (approximately 200 vehicles) along US Route 1 were shifted to Potomac Avenue. This shift occurred at the intersection of Potomac Avenue and US Route 1 for northbound traffic and north of the intersection of S. Glebe Road and US Route 1 for southbound traffic. Volume adjustments are shown in **Appendix J**. The resulting full build-out peak hour traffic volumes for the Updated Plan are shown in **Figure 7-4.**

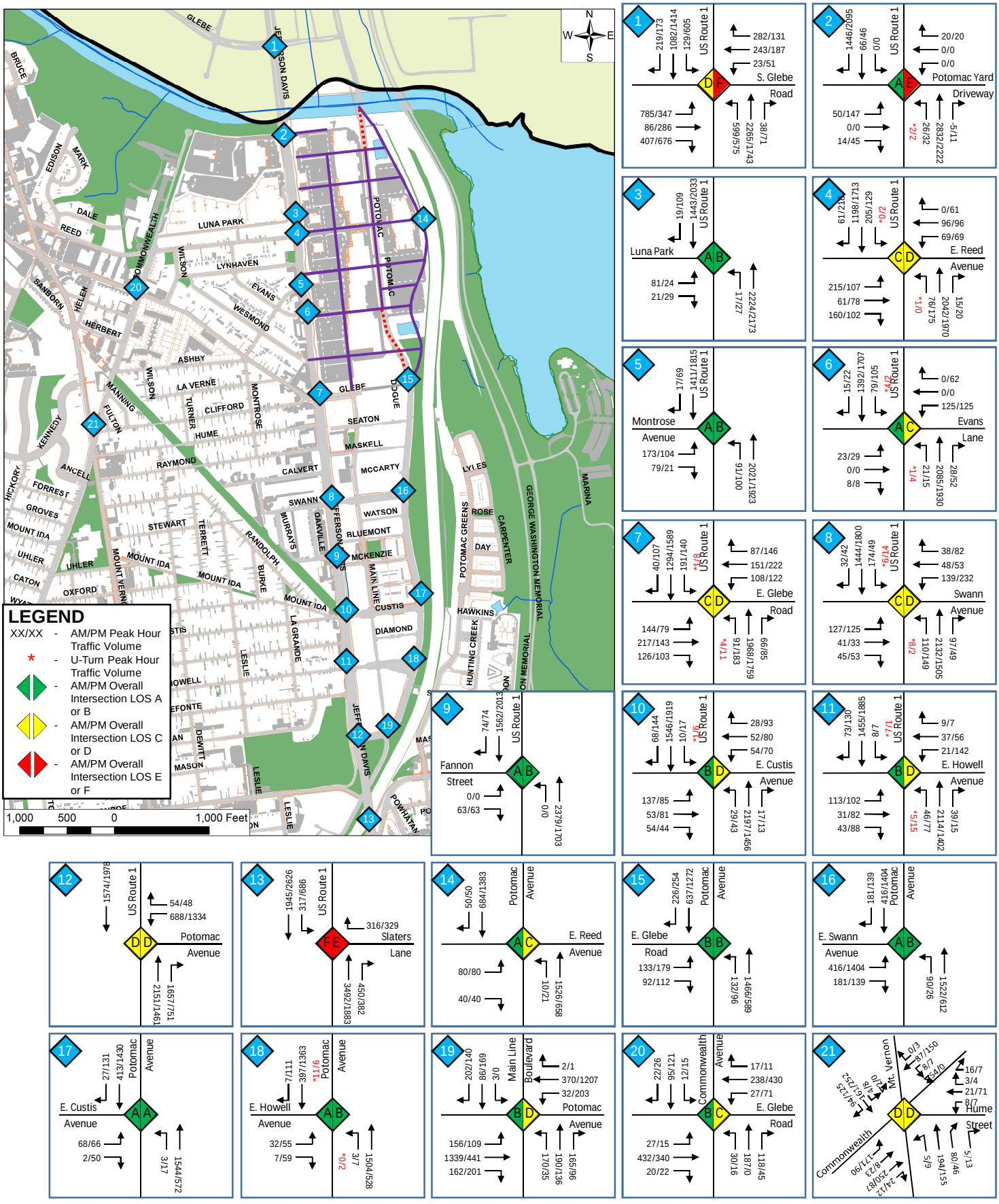

Figure 7-3: Full Build-Out Total Peak Hour Traffic Volumes and LOS (2010 Plan) Sheet 1 of 2

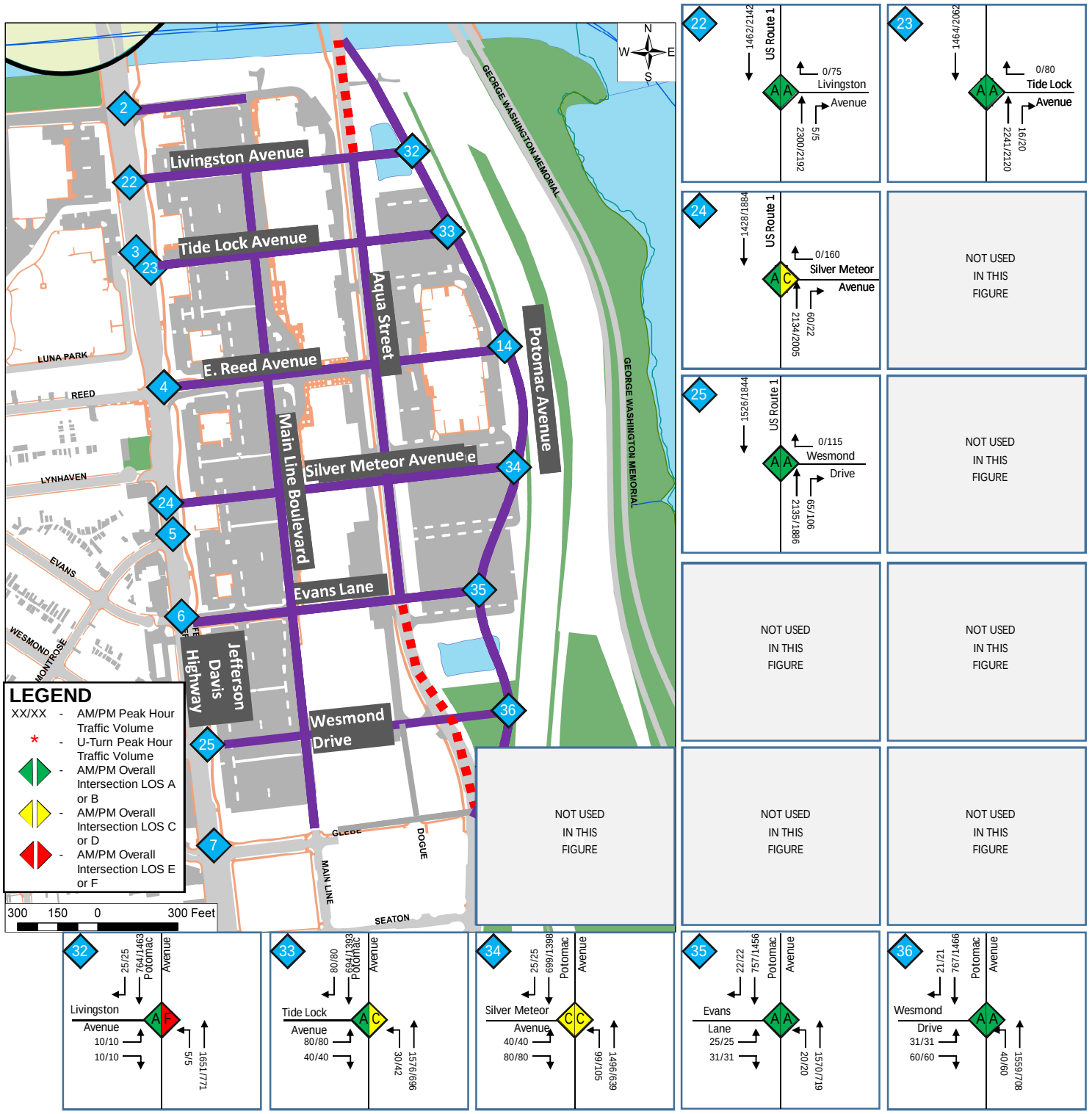

Figure 7-3: Full Build-Out Total Peak Hour Traffic Volumes and LOS (2010 Plan) Sheet 2 of 2

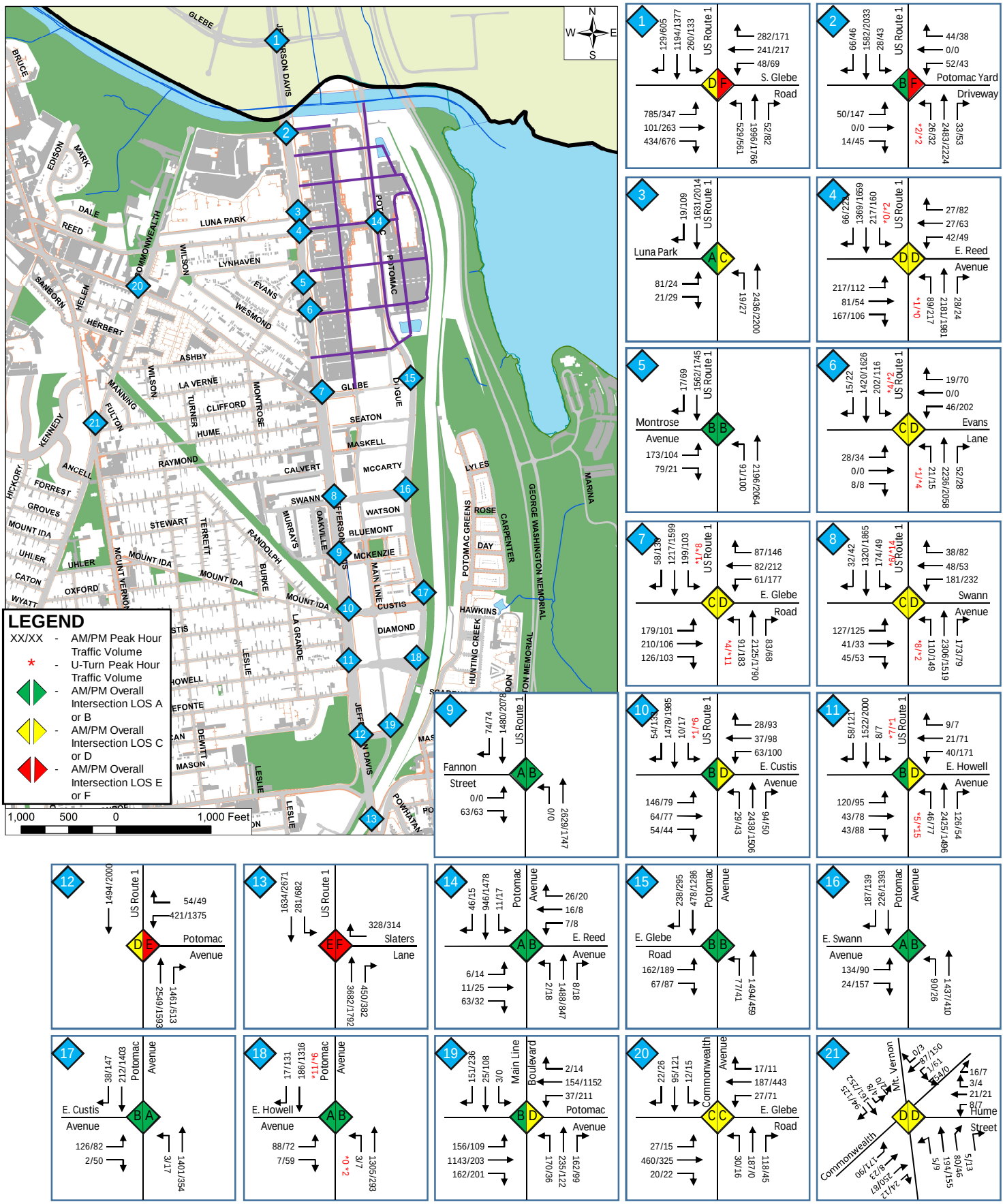

Figure 7-4: Full-Build Out Total Peak Hour Traffic Volumes (Updated Plan)

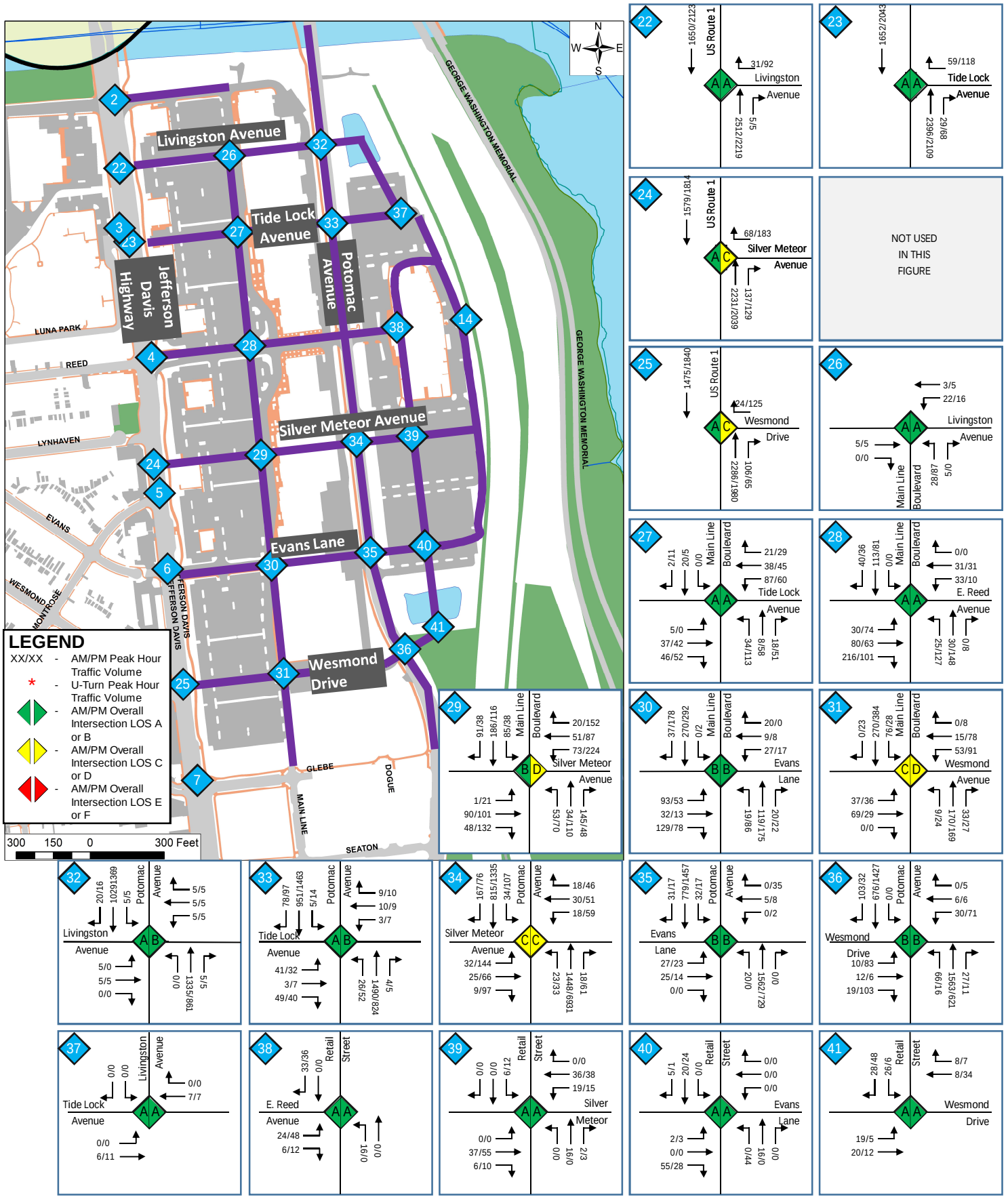

Figure 7-4: Full-Build Out Total Peak Hour Traffic Volumes and LOS (Updated Plan)

7.6 2040 FULL BUILD-OUT CONDITIONS TRAFFIC ANALYSES

Traffic impact analyses were conducted for the 2040 full build-out study year. Consistent with the analysis of existing conditions, the analysis of intersections along US Route 1 and Potomac Avenue was prepared in VISSIM and the analysis of all other relevant study intersections was prepared in Synchro. The analysis considers traffic signal timing and phasing adjustments at existing intersections and the intersection specific improvements discussed in **Chapter 4**. The analysis also considers two additional improvements: (1) the restriping of the westbound approach at Potomac Avenue and US Route 1 to result in two exclusive left turn lanes and one shared left-right lane and (2) the minor lengthening of the southbound left turn lane storage at the intersection of US Route 1 and E. Glebe Road. These improvements were identified during the course of analysis.

Level of Service and Delay

Full build-out analyses were based on the full build-out peak hour turning movement volumes, future full build-out lane use, and full build-out traffic control and signal timing at the study intersections. Results of the intersection capacity analyses are summarized in **Figure 7-3** and **Figure 7-4**, for the 2010 Plan and Updated Plan respectively and in **Table 7-1** for both scenarios**.** Synchro output reports are included in **Appendix D**. VISSIM output tables are included in **Appendix E.**

The analyses show that under the Updated Plan, all study intersections operate at an overall acceptable LOS D or better during both the AM and PM peak hours with the following exceptions:

- US Route 1 and S. Glebe Road - LOS F during the PM peak hour
- US Route 1 and Potomac Yard Driveway across from Alexandria Toyota - LOS F during the PM peak hour
- US Route 1 and Potomac Avenue – LOS E during the PM peak hour
- US Route 1 and Slaters Lane – LOS E/F during the AM/PM peak hour

Similar to 2021 conditions, it is noted that the intersection of S. Glebe Road and US Route 1 is within the boundaries of Arlington County. The intersection serves as a gateway between Arlington and Alexandria and is one of the final full access intersections prior to Route 1 becoming essentially limited access to the north. The City may benefit from coordinating with the County in the future to implement appropriate mitigation measures and traffic signal coordination at this intersection to prevent it from becoming a bottleneck in the travel between the City and Arlington County.

Overall, analysis results demonstrate that the Updated Plan traffic impacts are generally consistent with the 2010 Plan traffic impacts. During the AM peak hour, all existing US Route 1 intersections operate at the same LOS under both the Updated Plan and the 2010 Plan, with the exception of:

- US Route 1 and Potomac Yard Driveway across from Alexandria Toyota which changes from LOS A to B
- US Route 1 and E. Reed Avenue which changes from LOS C to D
- US Route 1 and Montrose Avenue which changes from LOS A to B
- US Route 1 and Evans Lane which changes from LOS A to C
- US Route 1 and Slaters Lane which changes from LOS F to E (an improvement)

During the AM peak hour, all existing Potomac Avenue intersections operate at the same LOS under both the Updated Plan and the 2010 Plan, with the exception of:

- Potomac Avenue and E. Custis Avenue which changes from LOS A to B

The majority of these changes will result in changes in overall vehicle delay and travel characteristics that are imperceptible to the average driver.

During the PM peak hour, all existing US Route 1 intersections operate at the same LOS under both the Updated Plan and the 2010 Plan, with the exception of:

- US Route 1 and Potomac Yard Driveway across from Alexandria Toyota which changes from LOS E to F
- US Route 1 and Luna Park Drive which changes from LOS B to C
- US Route 1 and Evans Lane which changes from LOS C to D
- US Route 1 and Potomac Avenue which changes from LOS D to E
- US Route 1 and Slaters Lane which changes from LOS E to F

Generally existing intersections along Potomac Avenue will operate with the same LOS when comparing the two plans, with the exception of:

- Potomac Avenue and E. Reed Avenue which changes from LOS C to B (an improvement)

It is noted that due to the higher traffic volumes associated with the Updated Plan and the more detailed assignment of traffic through the grid network of streets, there are many instances where the Updated Plan results in increases in vehicle delays for specific movements and approaches. These increases still result in most intersections continuing to operate at overall LOS D or better during both the AM and PM peak hours and most intersections operate at the same LOS under the Updated Plan and the 2010 Plan. As mentioned previously, it is noted that the Updated Plan shows Potomac Avenue in its current alignment, with full build-out development occurring along both sides of Potomac Avenue. The 2010 Plan considered Potomac Avenue to be relocated as the easternmost street in the area. This results in a different orientation of internal intersections with Potomac Avenue.

The new right-in, right-out intersections (site entrances) of the Updated Plan and the 2010 Plan along US Route 1 all operate at an overall LOS C or better during both the AM and PM peak hours. Individual intersection results are generally consistent between the two plans. The new full movement intersections (site entrances) of the Updated Plan along Potomac Avenue operate at an overall LOS C or better during both the AM and PM peak hours. When comparing the Updated Plan to the 2010 Plan, the site entrances operate with similar or improved LOS.

The results show that the Updated Plan and the 2010 plan have similar traffic impacts, and the specific mix and location of land uses in the Updated Plan results in traffic impacts that are consistent with the impacts that were previously approved by the City. Specific intersections where operations are forecasted to be LOS E or F under the Updated Plan are also forecasted to be LOS E or F under the 2010 Plan. It is likely however, the some of the instances of LOS E or F noted in this study could have been the result of the over assignment of vehicle trips to certain movements.

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and S. Glebe Road	NB	LT	67.8 (E)	*36.3 (D)*	74.3 (E)	*35.2 (D)*	68.1 (E)	*36.6 (D)*	72.8 (E)	*30.8 (C)*
		TH	28.8 (C)		23.3 (C)		29 (C)		18 (B)	
		RT	18.4 (B)		15.5 (B)		19.1 (B)		11.5 (B)	
	SB	LT	71.8 (E)	*43.2 (D)*	158.3 (F)	*171.1 (F)*	71.7 (E)	*46.9 (D)*	287.3 (F)	*325.9 (F)*
		TH	41.1 (D)		184.6 (F)		45.2 (D)		360.8 (F)	
		RT	8.1 (A)		142 (F)		9.1 (A)		237.9 (F)	
	EB	LT	74.1 (E)	*56.3 (E)*	237.8 (F)	*283.1 (F)*	75.2 (E)	*57.8 (E)*	531.6 (F)	*658.4 (F)*
		TH	79.9 (E)		266.9 (F)		78.9 (E)		621.8 (F)	
		RT	15.5 (B)		315 (F)		19.6 (B)		739.1 (F)	
	WB	LT	68.5 (E)	*44.6 (D)*	102.9 (F)	*53.7 (D)*	69.4 (E)	*45.7 (D)*	414.7 (F)	*97.1 (F)*
		TH	69.4 (E)		70.1 (E)		69.6 (E)		69.1 (E)	
		RT	22 (C)		10.6 (B)		20.8 (C)		10.8 (B)	
	Intersection		***44 (D)***		***126.3 (F)***		***45.7 (D)***		***213.8 (F)***	
US Route 1 and Potomac Yard Driveway opposite Alexandria Toyota	NB	U-Turn	74.4 (E)	*2.2 (A)*	106 (F)	*4.4 (A)*	91.1 (F)	*3.5 (A)*	142.9 (F)	*6.5 (A)*
		LT	77.1 (E)		103.2 (F)		81.3 (F)		109.1 (F)	
		TH	1.5 (A)		3 (A)		2.8 (A)		5.1 (A)	
		RT	1.7 (A)		2.2 (A)		2.5 (A)		3.8 (A)	
	SB	LT	0 (A)	*12.1 (B)*	0 (A)	*126 (F)*	73.2 (E)	*30.8 (C)*	202.8 (F)	*205.3 (F)*
		TH	11.8 (B)		126.5 (F)		30.1 (C)		206.4 (F)	
		RT	18.2 (B)		102.9 (F)		29.6 (C)		154 (F)	
	EB	LT	78.6 (E)	*70.3 (E)*	78.4 (E)	*77.4 (E)*	78.5 (E)	*70.7 (E)*	94.6 (F)	*95 (F)*
		TH	0 (A)		0 (A)		0 (A)		0 (A)	
		RT	35 (C)		74.2 (E)		37.7 (D)		96.4 (F)	
	WB	LT	70.9 (E)	*71.4 (E)*	111.5 (F)	*81.4 (F)*	92.5 (F)	*82.3 (F)*	125 (F)	*78.7 (E)*
		TH	0 (A)		0 (A)		0 (A)		0 (A)	
		RT	72 (E)		57.1 (E)		69.6 (E)		52.9 (D)	
	Intersection		***9.1 (A)***		***59.9 (E)***		***18.5 (B)***		***87.2 (F)***	
US Route 1 and Luna Park Drive	NB	LT	5.5 (A)	*0.2 (A)*	43.5 (D)	*0.7 (A)*	17.4 (B)	*0.3 (A)*	49.1 (D)	*1 (A)*
		TH	0.2 (A)		0.2 (A)		0.2 (A)		0.4 (A)	
	SB	TH	9.3 (A)	*9.3 (A)*	34.4 (C)	*33.3 (C)*	17.9 (B)	*17.8 (B)*	47.3 (D)	*46 (D)*
		RT	5.7 (A)		12.3 (B)		7 (A)		18 (B)	
	EB	LT	73.8 (E)	*58.7 (E)*	80.5 (F)	*42.2 (D)*	77.3 (E)	*61.7 (E)*	91.1 (F)	*48 (D)*
		RT	5.9 (A)		13.7 (B)		7.8 (A)		16.1 (B)	
	Intersection		***5.8 (A)***		***16 (B)***		***9.9 (A)***		***20.4 (C)***	

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and E. Reed Avenue	NB	U-Turn	0 (A)	*16.1 (B)*	0 (A)	*21.7 (C)*	0 (A)	*19.5 (B)*	0 (A)	*24.4 (C)*
		LT	22.7 (C)		53.1 (D)		43.9 (D)		60.9 (E)	
		TH	15.9 (B)		19.1 (B)		18.8 (B)		20.7 (C)	
		RT	2.6 (A)		3.4 (A)		4.2 (A)		5.2 (A)	
	SB	U-Turn	0 (A)	*20.9 (C)*	37.6 (D)	*51.2 (D)*	0 (A)	*36.1 (D)*	69.2 (E)	*68.2 (E)*
		LT	103.1 (F)		53 (D)		115.9 (F)		51.7 (D)	
		TH	8.1 (A)		52.1 (D)		24.8 (C)		72.2 (E)	
		RT	6.2 (A)		42.5 (D)		11.3 (B)		47 (D)	
	EB	LT	102.9 (F)	*99.8 (F)*	59.2 (E)	*60.4 (E)*	254.6 (F)	*265.9 (F)*	56.7 (E)	*60.8 (E)*
		TH	117.3 (F)		65 (E)		282 (F)		70.6 (E)	
		RT	89.7 (F)		58.3 (E)		272.1 (F)		59.9 (E)	
	WB	LT	50.2 (D)	*45.9 (D)*	47.6 (D)	*48.5 (D)*	95.7 (F)	*63.3 (E)*	53 (D)	*43.4 (D)*
		TH	56.8 (E)		62.8 (E)		59.5 (E)		61.7 (E)	
		RT	14.7 (B)		27.4 (C)		16.6 (B)		23 (C)	
	Intersection		***28.4 (C)***		***37.6 (D)***		***51.9 (D)***		***44.2 (D)***	
US Route 1 and Montrose Avenue	NB	LT	22 (C)	*6.3 (A)*	41.4 (D)	*11.2 (B)*	45.2 (D)	*14.4 (B)*	33.1 (C)	*13.9 (B)*
		TH	5.6 (A)		9.7 (A)		13 (B)		13 (B)	
	SB	TH	3.5 (A)	*3.5 (A)*	10.9 (B)	*10.7 (B)*	11.3 (B)	*11.2 (B)*	16.2 (B)	*15.9 (B)*
		RT	3.8 (A)		6.1 (A)		5.5 (A)		8.7 (A)	
	EB	LT	68.2 (E)	*63.5 (E)*	85.9 (F)	*83.2 (F)*	66.9 (E)	*61.9 (E)*	106.8 (F)	*104.3 (F)*
		RT	53 (D)		69.8 (E)		50.7 (D)		91.6 (F)	
	Intersection		***9.4 (A)***		***13.7 (B)***		***16.5 (B)***		***18.4 (B)***	
US Route 1 and Evans Lane	NB	U-Turn	0 (A)	*5.5 (A)*	95.8 (F)	*23.1 (C)*	0 (A)	*22.7 (C)*	109.3 (F)	*33.4 (C)*
		LT	55.4 (E)		86.5 (F)		69.2 (E)		96 (F)	
		TH	5 (A)		22.5 (C)		22.4 (C)		32.8 (C)	
		RT	3.5 (A)		20.4 (C)		18.7 (B)		30.6 (C)	
	SB	U-Turn	60.8 (E)	*9 (A)*	81.5 (F)	*27.7 (C)*	72.8 (E)	*15.3 (B)*	92.6 (F)	*39.8 (D)*
		LT	64.4 (E)		76.6 (E)		75.2 (E)		82.5 (F)	
		TH	5.8 (A)		24.9 (C)		6.9 (A)		37.1 (D)	
		RT	3.5 (A)		15.2 (B)		3.1 (A)		28.5 (C)	
	EB	LT	74.3 (E)	*58 (E)*	63.9 (E)	*56.4 (E)*	74 (E)	*61.5 (E)*	56.9 (E)	*52.2 (D)*
		TH	0 (A)		0 (A)		0 (A)		0 (A)	
		RT	18 (B)		29.4 (C)		19.2 (B)		28.5 (C)	
	WB	LT	75.4 (E)	*59.7 (E)*	75.8 (E)	*67.2 (E)*	75.6 (E)	*64 (E)*	89 (F)	*83.3 (F)*
		TH	0 (A)		0 (A)		0 (A)		0 (A)	
		RT	31.8 (C)		51.4 (D)		37.7 (D)		67.7 (E)	
	Intersection		***8.5 (A)***		***27.8 (C)***		***20.5 (C)***		***40.4 (D)***	

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and E. Glebe Road	NB	U-Turn	63.2 (E)	*13.2 (B)*	70.3 (E)	*25.9 (C)*	58 (E)	*21.6 (C)*	73.2 (E)	*32.8 (C)*
		LT	56.5 (E)		69.6 (E)		51 (D)		74.5 (E)	
		TH	11 (B)		21.6 (C)		20.3 (C)		28.7 (C)	
		RT	14.6 (B)		18.7 (B)		19.9 (B)		24.8 (C)	
	SB	U-Turn	102.2 (F)	*32.1 (C)*	65.7 (E)	*37.4 (D)*	130.1 (F)	*32.9 (C)*	69 (E)	*42.2 (D)*
		LT	128.7 (F)		68.8 (E)		138.3 (F)		71.1 (E)	
		TH	18.8 (B)		34.9 (C)		17.9 (B)		40.8 (D)	
		RT	16.5 (B)		29.7 (C)		16 (B)		35.7 (D)	
	EB	LT	56.5 (E)	*46.5 (D)*	74.2 (E)	*58.1 (E)*	68.5 (E)	*53.3 (D)*	114.2 (F)	*80.6 (F)*
		TH	51.8 (D)		52.1 (D)		50.4 (D)		45.9 (D)	
		RT	13.9 (B)		24.1 (C)		15 (B)		25.6 (C)	
	WB	LT	47.7 (D)	*50.4 (D)*	47.8 (D)	*54.2 (D)*	47.4 (D)	*50.7 (D)*	63.2 (E)	*67.5 (E)*
		TH	62.1 (E)		61.8 (E)		61.3 (E)		76 (E)	
		RT	38.3 (D)		48 (D)		43.8 (D)		60.9 (E)	
	Intersection		***27.3 (C)***		***35.4 (D)***		***31.9 (C)***		***44.6 (D)***	
US Route 1 and Swann Avenue	NB	U-Turn	65.9 (E)	*17.2 (B)*	147 (F)	*38.2 (D)*	61 (E)	*27.8 (C)*	146.6 (F)	*47.1 (D)*
		LT	58.9 (E)		142.9 (F)		58.9 (E)		146.8 (F)	
		TH	14.9 (B)		28.5 (C)		26.1 (C)		38.1 (D)	
		RT	15 (B)		26.9 (C)		28.6 (C)		34.6 (C)	
	SB	U-Turn	77.4 (E)	*26.5 (C)*	94.5 (F)	*30.1 (C)*	89.9 (F)	*26 (C)*	91.8 (F)	*32 (C)*
		LT	78.7 (E)		92.7 (F)		78.9 (E)		93.5 (F)	
		TH	20 (B)		28.1 (C)		19.3 (B)		30.3 (C)	
		RT	17.3 (B)		23 (C)		19.4 (B)		29.6 (C)	
	EB	LT	56.7 (E)	*53 (D)*	58.1 (E)	*51.8 (D)*	56.5 (E)	*53.1 (D)*	64.7 (E)	*56.1 (E)*
		TH	64.2 (E)		63.5 (E)		64.6 (E)		62.7 (E)	
		RT	31.5 (C)		27.9 (C)		32.1 (C)		30.1 (C)	
	WB	LT	56.1 (E)	*52.5 (D)*	60.2 (E)	*55.1 (E)*	63.4 (E)	*60.5 (E)*	60.7 (E)	*56 (E)*
		TH	56.4 (E)		58.3 (E)		63.1 (E)		58 (E)	
		RT	33.7 (C)		38.5 (D)		42.5 (D)		41 (D)	
	Intersection		***25.8 (C)***		***37.4 (D)***		***25.8 (C)***		***37.4 (D)***	
US Route 1 and Fannon Street	SB	*TH*	1.8 (A)	*1.8 (A)*	7.6 (A)	*7.5 (A)*	2 (A)	*2 (A)*	8.1 (A)	*8 (A)*
		RT	2.3 (A)		3.3 (A)		2.5 (A)		3.4 (A)	
	EB	RT	11.1 (B)	*11.1 (B)*	83.3 (F)	*83.3 (F)*	12.2 (B)	*12.2 (B)*	75.8 (E)	*75.8 (E)*
	Intersection		***2.2 (A)***		***10.1 (B)***		***2.4 (A)***		***10.4 (B)***	

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and E. Custis Avenue	NB	U-Turn	0 (A)	*4.6 (A)*	0 (A)	*27.4 (C)*	0 (A)	*13.6 (B)*	0 (A)	*34.5 (C)*
		LT	91.4 (F)		87.9 (F)		90.1 (F)		91 (F)	
		TH	3.3 (A)		25.7 (C)		12.7 (B)		33.2 (C)	
		RT	4.5 (A)		18.5 (B)		10.1 (B)		23.2 (C)	
	SB	U-Turn	52.8 (D)	*9.8 (A)*	108.9 (F)	*39.7 (D)*	85.8 (F)	*11.3 (B)*	111.9 (F)	*41.3 (D)*
		LT	73.2 (E)		108.8 (F)		78.1 (E)		104.7 (F)	
		TH	9.3 (A)		39 (D)		10.8 (B)		40.6 (D)	
		RT	10.1 (B)		38.8 (D)		13 (B)		42 (D)	
	EB	LT	68.3 (E)	*59.5 (E)*	142.3 (F)	*107.4 (F)*	75.2 (E)	*67 (E)*	154.9 (F)	*109.3 (F)*
		TH	62.2 (E)		89.8 (F)		67.6 (E)		85.3 (F)	
		RT	34.9 (C)		73.3 (E)		44.4 (D)		71.8 (E)	
	WB	LT	60.3 (E)	*49.6 (D)*	74.5 (E)	*61.7 (E)*	61.7 (E)	*51.4 (D)*	93.1 (F)	*77.9 (E)*
		TH	54.3 (D)		67 (E)		53.7 (D)		78.2 (E)	
		RT	22.5 (C)		47.2 (D)		22.3 (C)		60.8 (E)	
	Intersection		***13 (B)***		***40.6 (D)***		***18.1 (B)***		***46 (D)***	
US Route 1 and E. Howell Avenue	NB	U-Turn	101.8 (F)	*5 (A)*	140.7 (F)	*31.3 (C)*	95 (F)	*11.9 (B)*	138.1 (F)	*37.8 (D)*
		LT	87.9 (F)		125.9 (F)		94.4 (F)		124.3 (F)	
		TH	2.7 (A)		25.1 (C)		10.2 (B)		32.8 (C)	
		RT	2.7 (A)		19 (B)		8 (A)		24.9 (C)	
	SB	U-Turn	73.7 (E)	*8.8 (A)*	89.2 (F)	*17.6 (B)*	78.6 (E)	*8.5 (A)*	82.7 (F)	*17.1 (B)*
		LT	83.5 (F)		84.9 (F)		77.7 (E)		82.6 (F)	
		TH	8.2 (A)		17.5 (B)		7.9 (A)		17 (B)	
		RT	7.4 (A)		14.3 (B)		7.4 (A)		13.2 (B)	
	EB	LT	75.1 (E)	*71.1 (E)*	145.6 (F)	*134.6 (F)*	79.3 (E)	*76 (E)*	176.1 (F)	*167.9 (F)*
		TH	78.4 (E)		136.8 (F)		74.5 (E)		169.7 (F)	
		RT	55.4 (E)		119.6 (F)		68.3 (E)		157.8 (F)	
	WB	LT	66.6 (E)	*53.6 (D)*	105 (F)	*101.5 (F)*	77.3 (E)	*65.6 (E)*	105.8 (F)	*104.9 (F)*
		TH	60.7 (E)		98.4 (F)		63.7 (E)		108.5 (F)	
		RT	6.8 (A)		49 (D)		20.5 (C)		36.3 (D)	
	Intersection		***11.9 (B)***		***36.7 (D)***		***15.3 (B)***		***41.6 (D)***	
US Route 1 and Potomac Avenue	NB	TH	29.6 (C)	*70.8 (E)*	103.4 (F)	*87 (F)*	43.2 (D)	*61.3 (E)*	158.8 (F)	*128.8 (F)*
		RT	113.6 (F)		55.2 (E)		86.8 (F)		37.3 (D)	
	SB	TH	7.2 (A)	*7.2 (A)*	20.6 (C)	*20.6 (C)*	6.3 (A)	*6.3 (A)*	18.8 (B)	*18.8 (B)*
	WB	LT	48 (D)	*47.4 (D)*	29.8 (C)	*29.7 (C)*	43.4 (D)	*43.1 (D)*	31.9 (C)	*32.3 (C)*
		RT	41.4 (D)		28.1 (C)		40.1 (D)		40.7 (D)	
	Intersection		***46.8 (D)***		***49.5 (D)***		***42 (D)***		***61.1 (E)***	

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
US Route 1 and Slaters Lane	NB	TH	129.2 (F)	*128.6 (F)*	126.3 (F)	*120.9 (F)*	111.3 (F)	*109.7 (F)*	254.8 (F)	*237.4 (F)*
		RT	124.1 (F)		95.2 (F)		97.3 (F)		158.5 (F)	
	SB	LT	52 (D)	*12 (B)*	38.8 (D)	*18.1 (B)*	46.1 (D)	*11.9 (B)*	31.7 (C)	*13.8 (B)*
		TH	4.9 (A)		12.7 (B)		5.9 (A)		9.3 (A)	
	WB	RT	381.4 (F)	*381.4 (F)*	20 (B)	*20 (B)*	240.9 (F)	*240.9 (F)*	15.9 (B)	*15.9 (B)*
	Intersection		***87.7 (F)***		***57.3 (E)***		***77.8 (E)***		***87.6 (F)***	
Potomac Avenue and E. Reed Avenue	NB	LT	63.3 (E)	*3.2 (A)*	51.5 (D)	*16.9 (B)*	69.9 (E)	*3.7 (A)*	51.2 (D)	*17.1 (B)*
		TH	2.8 (A)		14.9 (B)		3.6 (A)		16.4 (B)	
		RT	0 (A)		0 (A)		3.2 (A)		15.3 (B)	
	SB	LT	0 (A)	*10.1 (B)*	0 (A)	*23.8 (C)*	52.3 (D)	*13.2 (B)*	65.1 (E)	*13.7 (B)*
		TH	10.2 (B)		23.9 (C)		12.8 (B)		13.2 (B)	
		RT	8.3 (A)		21.2 (C)		12 (B)		10.5 (B)	
	EB	LT	27.8 (C)	*18.5 (B)*	30.6 (C)	*26.7 (C)*	25.5 (C)	*15.1 (B)*	28 (C)	*25.3 (C)*
		TH	0 (A)		0 (A)		29.1 (C)		30.9 (C)	
		RT	5.7 (A)		18.8 (B)		11.5 (B)		19.8 (B)	
	WB	LT	0 (A)	*0 (A)*	0 (A)	*0 (A)*	29.4 (C)	*17.7 (B)*	37.3 (D)	*20.5 (C)*
		TH	0 (A)		0 (A)		26.8 (C)		32.4 (C)	
		RT	0 (A)		0 (A)		7.6 (A)		7 (A)	
	Intersection		***6.3 (A)***		***21.9 (C)***		***8.2 (A)***		***15.4 (B)***	
Potomac Avenue and E. Glebe Road	NB	LT	11.2 (B)	*7.9 (A)*	19.1 (B)	*10.5 (B)*	10.7 (B)	*8.9 (A)*	13.2 (B)	*5.9 (A)*
		TH	7.7 (A)		9.6 (A)		8.8 (A)		5.3 (A)	
	SB	TH	16.1 (B)	*16.2 (B)*	22.7 (C)	*22.9 (C)*	13 (B)	*13.1 (B)*	19.2 (B)	*19.3 (B)*
		RT	16.3 (B)		23.6 (C)		13.4 (B)		19.6 (B)	
	EB	LT	37.6 (D)	*29.2 (C)*	36.9 (D)	*27.1 (C)*	39.8 (D)	*31.7 (C)*	37.7 (D)	*29.6 (C)*
		RT	8.6 (A)		11.7 (B)		10.7 (B)		11.1 (B)	
	Intersection		***12.2 (B)***		***19.8 (B)***		***12 (B)***		***17.1 (B)***	
Potomac Avenue and Swann Avenue	NB	LT	8.4 (A)	*6.2 (A)*	25.1 (C)	*8.5 (A)*	8.4 (A)	*6.3 (A)*	17.8 (B)	*7.4 (A)*
		TH	6.1 (A)		7.7 (A)		6.2 (A)		6.7 (A)	
	SB	TH	3.1 (A)	*3.7 (A)*	12.5 (B)	*12.7 (B)*	3.2 (A)	*4 (A)*	11.6 (B)	*11.7 (B)*
		RT	4.5 (A)		14.4 (B)		4.9 (A)		12.9 (B)	
	EB	LT	37.6 (D)	*38.5 (D)*	39.5 (D)	*41.9 (D)*	36.8 (D)	*37.4 (D)*	39.7 (D)	*42 (D)*
		RT	41 (D)		43.1 (D)		40.8 (D)		43.3 (D)	
	Intersection		***7.5 (A)***		***14.5 (B)***		***8.5 (A)***		***14.8 (B)***	

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
Potomac Avenue and E. Custis Avenue	NB	U-Turn	0 (A)	*6.8 (A)*	0 (A)	*4.9 (A)*	0 (A)	*8.3 (A)*	0 (A)	*4 (A)*
		LT	4.6 (A)		18.8 (B)		4.4 (A)		19.8 (B)	
		TH	6.8 (A)		4.5 (A)		8.3 (A)		3.2 (A)	
	SB	TH	3.4 (A)	*3.3 (A)*	8.5 (A)	*8.5 (A)*	3.1 (A)	*2.9 (A)*	4.6 (A)	*4.6 (A)*
		RT	2.3 (A)		7.9 (A)		2.1 (A)		4.6 (A)	
	EB	LT	40.4 (D)	*39.9 (D)*	39.7 (D)	*28.7 (C)*	40.1 (D)	*39.9 (D)*	38 (D)	*31.9 (C)*
		RT	22.8 (C)		18.6 (B)		27.2 (C)		22.4 (C)	
	Intersection		***7.7 (A)***		***8.9 (A)***		***10.2 (B)***		***6.6 (A)***	
Potomac Avenue and E. Howell Avenue	NB	U-Turn	0 (A)	*3.7 (A)*	19.1 (B)	*6.2 (A)*	0 (A)	*5.2 (A)*	18.9 (B)	*4.6 (A)*
		LT	5.8 (A)		15.8 (B)		3.9 (A)		12.5 (B)	
		TH	3.7 (A)		6 (A)		5.2 (A)		4.3 (A)	
	SB	U-Turn	17.2 (B)	*2.6 (A)*	13 (B)	*13.8 (B)*	19.1 (B)	*3.9 (A)*	6.3 (A)	*6.8 (A)*
		TH	2 (A)		14.2 (B)		3 (A)		7 (A)	
		RT	1.5 (A)		8.6 (A)		3.6 (A)		4.9 (A)	
	EB	LT	52.6 (D)	*49.7 (D)*	80.1 (F)	*81 (F)*	57.8 (E)	*56.9 (E)*	62.9 (E)	*62.3 (E)*
		RT	38.4 (D)		81.6 (F)		48.6 (D)		61.6 (E)	
	Intersection		***4.8 (A)***		***16.4 (B)***		***8.6 (A)***		***11 (B)***	
Potomac Avenue and Main Line Boulevard	NB Mainline	LT	29.3 (C)	*28.4 (C)*	61.2 (E)	*58.7 (E)*	27.4 (C)	*28.8 (C)*	49.9 (D)	*51.4 (D)*
		TH	28 (C)		57.6 (E)		29.3 (C)		51.6 (D)	
		RT	28.1 (C)		59.4 (E)		29.5 (C)		51.7 (D)	
	SB Mainline	LT	19.4 (B)	*25.3 (C)*	0 (A)	*59.8 (E)*	21.8 (C)	*23.4 (C)*	0 (A)	*70.9 (E)*
		TH	24.7 (C)		60.5 (E)		22.1 (C)		68.8 (E)	
		RT	25.7 (C)		58.5 (E)		23.7 (C)		71.9 (E)	
	EB Potomac	LT	15.5 (B)	*14.3 (B)*	67 (E)	*34.4 (C)*	16.4 (B)	*15.5 (B)*	44.1 (D)	*28.4 (C)*
		TH	14.4 (B)		30.7 (C)		15.7 (B)		28.5 (C)	
		RT	11.7 (B)		24.3 (C)		12.7 (B)		19.5 (B)	
	WB Potomac	LT	39.6 (D)	*12.5 (B)*	59.4 (E)	*43.6 (D)*	38.8 (D)	*14.9 (B)*	62.2 (E)	*43.9 (D)*
		TH	8.6 (A)		41.1 (D)		8.6 (A)		39.9 (D)	
		RT	11.6 (B)		43.8 (D)		13.7 (B)		43 (D)	
	Intersection		***18.7 (B)***		***44.4 (D)***		***19.9 (B)***		***46.2 (D)***	
Commonwealth Avenue & West Glebe Road/East Glebe Road*	EB	LTR	*25.3 (C)*		*17.6 (B)*		*29.1 (C)*		*16.9 (B)*	
	WB	LTR	*12.8 (B)*		*31.2 (C)*		*12.8 (B)*		*33.1 (C)*	
	NB	LTR	*14.0 (B)*		*13.0 (B)*		*14.0 (B)*		*13.0 (B)*	
	SB	LTR	*14.9 (B)*		*15.8 (B)*		*14.9 (B)*		*15.8 (B*	
	Intersection		***19.3 (B)***		***23.4 (C)***		***21.4 (C)***		***24.2 (C)***	

*Analyzed in Synchro

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue*	WB	LR	*51.7 (D)*		*51.6 (D)*		*51.7 (D)*		*51.6 (D)*	
	NB	TL	*31.9 (C)*	*30.0 (C)*	*30.2 (C)*	*28.9 (C)*	*31.9 (C)*	*30.0 (C)*	*30.2 (C)*	*28.9 (C)*
		R	*25.4 (C)*		*25.1 (C)*		*25.4 (C)*		*25.1 (C)*	
	SB	TL	*32.1 (C)*	*23.2 (C)*	*41.3 (D)*	*31.9 (C)*	*32.1 (C)*	*23.2 (C)*	*41.3 (D)*	*31.9 (C)*
		R	*7.6 (A)*		*12.3 (B)*		*7.6 (A)*		*12.3 (B)*	
	NEB	L	*37.5 (D)*	*46.7 (D)*	*44.2 (D)*	*46.9 (D)*	*37.5 (D)*	*46.7 (D)*	*44.2 (D)*	*46.9 (D)*
		TR	*52.3 (D)*		*49.0 (D)*		*52.3 (D)*		*49.0 (D)*	
	SWB	LTR	*52.9 (D)*		*55.4 (E)*		*52.9 (D)*		*55.4 (E)*	
	Intersection		***38.5 (D)***		***39.6 (D)***		***38.5 (D)***		***39.6 (D)***	
US Route 1 and Livingston Avenue	NB	TH	0.3 (A)	*0.3 (A)*	0.8 (A)	*0.8 (A)*	0.4 (A)	*0.4 (A)*	1.5 (A)	*1.5 (A)*
		RT	1.1 (A)		2 (A)		1.9 (A)		2.1 (A)	
	WB	RT	5.3 (A)	*5.3 (A)*	7.2 (A)	*7.2 (A)*	5.5 (A)	*5.5 (A)*	6.7 (A)	*6.7 (A)*
	Intersection		***0.4 (A)***		***1 (A)***		***0.5 (A)***		***1.8 (A)***	
US Route 1 and Tide Lock Avenue	NB	TH	0.7 (A)	*0.7 (A)*	0.6 (A)	*0.6 (A)*	0.7 (A)	*0.7 (A)*	0.8 (A)	*0.8 (A)*
		RT	1.4 (A)		0.9 (A)		1.1 (A)		1.3 (A)	
	WB	RT	7.2 (A)	*7.2 (A)*	6.5 (A)	*6.5 (A)*	7.8 (A)	*7.8 (A)*	8.2 (A)	*8.2 (A)*
	Intersection		***0.9 (A)***		***0.8 (A)***		***0.9 (A)***		***1.3 (A)***	
US Route 1 and Silver Meteor Avenue	NB	TH	3.3 (A)	*3.3 (A)*	4.9 (A)	*4.9 (A)*	4.8 (A)	*4.8 (A)*	6 (A)	*5.9 (A)*
		RT	2.4 (A)		3.6 (A)		4.5 (A)		4.2 (A)	
	WB	RT	19.3 (C)	*19.3 (C)*	183.4 (F)	*183.4 (F)*	34 (D)	*34 (D)*	270.4 (F)	*270.4 (F)*
	Intersection		***3.7 (A)***		***18.7 (C)***		***5.9 (A)***		***23.7 (C)***	
US Route 1 and Wesmond Drive	NB	TH	0.5 (A)	*0.5 (A)*	7 (A)	*6.9 (A)*	6.6 (A)	*6.5 (A)*	13.5 (B)	*13.4 (B)*
		RT	0.8 (A)		5.9 (A)		5 (A)		10.4 (B)	
	WB	RT	10.6 (B)	*10.6 (B)*	35.9 (E)	*35.9 (E)*	23 (C)	*23 (C)*	52.2 (F)	*52.2 (F)*
	Intersection		***0.6 (A)***		***8.8 (A)***		***6.7 (A)***		***16.2 (C)***	

*Analyzed in Synchro

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)								
Intersection	Approach	Mvmt	2010 Plan		Updated Plan			
			AM	PM	AM		PM	
Main Line Boulevard and Livingston Avenue*	NB	LTR	-	-	*7.2 (A)*		*7.7 (A)*	
	EB	LTR	-	-	*7.1 (A)*		*7.2 (A)*	
	WB	LTR	-	-	*7.3 (A*		*7.4 (A)*	
	Intersection		**-**	**-**	***7.2 (A)***		***7.6 (A)***	
Main Line Boulevard and Tide Lock Avenue*	NB	LTR	-	-	*10.8 (B)*		*12.5 (B)*	
	SB	LTR	-	-	*11.4 (B)*		*9.4 (A)*	
	EB	L	-	-	*7.3 (A)*	*0.4 (A)*	*0 (A)*	*0 (A)*
		T	-	-	*0 (A)*		*0 (A)*	
	WB	L	-	-	*7.5 (A)*	*4.5 (A)*	*7.5 (A)*	*3.4 (A)*
		T	-	-	*0 (A)*		*0 (A)*	
	Intersection		**-**	**-**	***5.0 (A)***		***7.3 (A)***	
Main Line Boulevard and E. Reed Avenue*	NB	LTR	-	-	*11.9 (B)*		*7.7 (A)*	
	SB	LTR	-	-	*11.5 (B)*		*0 (A)*	
	EB	TL	-	-	*7.3 (A)*	*0.7 (A)*	*17.9 (C)*	*14.2 (B)*
		R	-	-	*0 (A)*		*9.2 (A)*	
	WB	L	-	-	*7.4 (A)*	*3.8 (A)*	*15.4 (C)*	*14.2 (B)*
		TR	-	-	*0 (A)*		*13.8 (B)*	
	Intersection		**-**	**-**	***4.8 (A)***		***7.3 (A)***	
Main Line Boulevard and Silver Meteor Avenue*	NB	LTR	-	-	*14.4 (B)*		*142.8 (F)*	
	SB	LTR	-	-	*21.5 (C)*		*74.9 (F)*	
	EB	LTR	-	-	*7.4 (A)*	*0.1 (A)*	*7.8 (A)*	*0.6 (A)*
			-	-	*0 (A)*		*0 (A)*	
	WB	LTR	-	-	*7.6 (A)*	*3.9 (A)*	*8.2 (A)*	*4.0 (A)*
			-	-	*0 (A)*		*0 (A)*	
	Intersection		**-**	**-**	***13.3 (B)***		***43.0 (D)***	
Main Line Boulevard and Evans Lane*	NB	LTR	-	-	*26.7 (C)*		*3.9 (A)*	
	SB	LTR	-	-	*33.3 (C)*		*5.1 (A)*	
	EB	LTR	-	-	*1.9 (A)*		*39.0 (D)*	
	WB	LTR	-	-	*6.5 (A)*		*31.9 (C)*	
	Intersection		**-**	**-**	***19.7 (B)***		***10.7 (B)***	
Main Line Boulevard and Wesmond Drive*	NB	LTR	-	-	*13.7 (B)*		*21.5 (C)*	
	SB	LTR	-	-	*21.7 (C)*		*39.6 (E)*	
	EB	LTR	-	-	*7.3 (A)*	*2.5 (A)*	*7.4 (A)*	*4.1 (A)*
			-	-	*0 (A)*		*0 (A)*	
	WB	LTR	-	-	*7.4 (A)*	*5.8 (A)*	*7.4 (A)*	*3.8 (A)*
			-	-	*0 (A)*		*0 (A)*	
	Intersection		**-**	**-**	***15.1 (C)***		***25.5 (D)***	

"-": intersection or movement not considered in this scenario / *Analyzed in Synchro

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		AM		PM	
Potomac Avenue and Livingston Avenue	NB	LT	58.4 (E)	*4.3 (A)*	53.5 (D)	*4.3 (A)*	0 (A)	*4.8 (A)*	0 (A)	*3.8 (A)*
		TH	4 (A)		4 (A)		4.8 (A)		3.8 (A)	
		RT	-		-		3.7 (A)		4 (A)	
	SB	LT	-	*9.8 (A)*	-	*97.9 (F)*	50.9 (D)	*10.8 (B)*	54.9 (D)	*18.4 (B)*
		TH	9.8 (A)		97.9 (F)		10.6 (B)		18.2 (B)	
		RT	9.4 (A)		95.5 (F)		9.5 (A)		17.6 (B)	
	EB	LT	-	*6.2 (A)*	-	*20 (B)*	29.7 (C)	*30.6 (C)*	0 (A)	*26.6 (C)*
		TH	-		-		31.6 (C)		26.6 (C)	
		RT	6.2 (A)		20 (B)		0 (A)		0 (A)	
	WB	LT	-	-	-	-	33.8 (C)	*22.2 (C)*	38.4 (D)	*22.8 (C)*
		TH	-		-		31.7 (C)		29.3 (C)	
		RT	-		-		4.7 (A)		4.3 (A)	
	Intersection		***9.7 (A)***		***97.3 (F)***		***7.6 (A)***		***13.2 (B)***	
Potomac Avenue and Tide Lock Avenue	NB	LT	65 (E)	*4.3 (A)*	55.6 (E)	*7.3 (A)*	62.9 (E)	*5 (A)*	57.3 (E)	*14.9 (B)*
		TH	3.6 (A)		3.9 (A)		4 (A)		12.4 (B)	
		RT	-		-		2.4 (A)		10.6 (B)	
	SB	LT	-	*9.1 (A)*	-	*34.7 (C)*	66.1 (E)	*10.9 (B)*	62.7 (E)	*21.3 (C)*
		TH	9.2 (A)		34.8 (C)		10.8 (B)		21 (C)	
		RT	8.5 (A)		32.4 (C)		9.9 (A)		19.9 (B)	
	EB	LT	-	*8.1 (A)*	-	*15.2 (B)*	32.5 (C)	*21.9 (C)*	32.5 (C)	*23.3 (C)*
		TH	-		-		36.5 (D)		35.3 (D)	
		RT	8.1 (A)		15.2 (B)		12 (B)		13.6 (B)	
	WB	LT	-	-	-	-	30.6 (C)	*22 (C)*	30.7 (C)	*23.1 (C)*
		TH	-		-		32.5 (C)		33.8 (C)	
		RT	-		-		7.9 (A)		9.7 (A)	
	Intersection		***9.1 (A)***		***34.1 (C)***		***8.3 (A)***		***19.2 (B)***	

"-": intersection or movement not considered in current scenario

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)										
Intersection	Approach	Mvmt	2010 Plan				Updated Plan			
			AM		PM		**AM**		**PM**	
Potomac Avenue and Silver Meteor Avenue	NB	LT	56.6 (E)	*15.6 (B)*	50.7 (D)	*17.3 (B)*	68.5 (E)	*27.8 (C)*	52.9 (D)	*19.5 (B)*
		TH	13.2 (B)		12 (B)		24.8 (C)		18.3 (B)	
		RT	-		-		24.7 (C)		15.7 (B)	
	SB	LT	-	*22.1 (C)*	-	*22.5 (C)*	59.5 (E)	*30.4 (C)*	71.5 (E)	*26.9 (C)*
		TH	22.1 (C)		22.5 (C)		29.1 (C)		22.6 (C)	
		RT	23.1 (C)		21.3 (C)		31.2 (C)		25.7 (C)	
	EB	LT	-	*5.6 (A)*	-	*20.1 (C)*	31.9 (C)	*28.5 (C)*	51.8 (D)	*48.5 (D)*
		TH	-		-		29.2 (C)		50.9 (D)	
		RT	5.6 (A)		20.1 (C)		14.6 (B)		41.6 (D)	
	WB	LT	-	-	-	-	31.2 (C)	*23.9 (C)*	32.8 (C)	*28.2 (C)*
		TH	-		-		27.3 (C)		33.5 (C)	
		RT	-		-		11 (B)		17.5 (B)	
	Intersection		***21.7 (C)***		***22.3 (C)***		***28.8 (C)***		***27.4 (C)***	
Potomac Avenue and Evans Lane	NB	LT	60.6 (E)	*6.7 (A)*	53.3 (D)	*7.2 (A)*	56.1 (E)	*10.7 (B)*	0 (A)	*9.5 (A)*
		TH	6.1 (A)		6 (A)		10.2 (B)		9.5 (A)	
		RT	-		-		0 (A)		0 (A)	
	SB	LT	-	*7.1 (A)*	-	*10.3 (B)*	65.6 (E)	*10.1 (B)*	62.8 (E)	*16.9 (B)*
		TH	7.1 (A)		10.3 (B)		7.8 (A)		16.3 (B)	
		RT	7.3 (A)		10.3 (B)		6.6 (A)		14 (B)	
	EB	LT	27.8 (C)	*21.1 (C)*	28.7 (C)	*17.8 (B)*	34.8 (C)	*31.9 (C)*	28.6 (C)	*28.2 (C)*
		TH	-		-		29.2 (C)		27.6 (C)	
		RT	12.4 (B)		9.4 (A)		0 (A)		0 (A)	
	WB	LT	-	-	-	-	0 (A)	*26.9 (C)*	32 (C)	*11.1 (B)*
		TH	-		-		26.9 (C)		28.2 (C)	
		RT	-		-		0 (A)		5.2 (A)	
	Intersection		***7.1 (A)***		***9.5 (A)***		***11 (B)***		***14.6 (B)***	
Potomac Avenue and Wesmond Drive	NB	LT	67.4 (E)	*15.3 (B)*	53.7 (D)	*10.4 (B)*	66.7 (E)	*17.9 (B)*	53.1 (D)	*9.6 (A)*
		TH	13.6 (B)		7 (A)		16.3 (B)		8.5 (A)	
		RT	-		-		15.1 (B)		6.7 (A)	
	SB	LT	-	*4 (A)*	-	*5.3 (A)*	0 (A)	*5.3 (A)*	0 (A)	*4.1 (A)*
		TH	4 (A)		5.3 (A)		5.2 (A)		4 (A)	
		RT	4.5 (A)		7.7 (A)		5.7 (A)		6.1 (A)	
	EB	LT	-	*13.7 (B)*	-	*20.2 (C)*	43.1 (D)	*34.1 (C)*	56.8 (E)	*49.1 (D)*
		TH	-		-		36.9 (D)		56.4 (E)	
		RT	13.7 (B)		20.2 (C)	*4.5 (A)*	16.3 (B)		39.5 (D)	
	WB	LT	-	-	-	-	38.1 (D)	*38.4 (D)*	41.7 (D)	*41.5 (D)*
		TH	-		-		40.1 (D)		41.9 (D)	
		RT	-		-		0 (A)		38.6 (D)	
	Intersection		***4.5 (A)***		***5.9 (A)***		***14.1 (B)***		***11.2 (B)***	

"-": intersection or movement not considered in current scenario

Table 7-1: Full Build-Out Intersection Capacity Analyses – Delay (LOS) (seconds/veh)						
Intersection	Approach	Mvmt	2010 Plan		Updated Plan	
			AM	PM	AM	PM
Tide Lock Avenue and Livingston Avenue*	SB	LTR	-	-	*7.3 (A)*	*7.3 (A)*
	EB	LTR	-	-	*7 (A)*	*7 (A)*
	WB	LTR	-	-	*6.6 (A)*	*6.6 (A)*
	Intersection		**-**	**-**	***6.9 (A)***	***6.9 (A)***
Retail Street and E. Reed Avenue*	NB	LTR	-	-	*7.3 (A)*	*7.1 (A)*
	SB	LTR	-	-	*6.5 (A)*	*6.6 (A)*
	EB	LTR	-	-	*7.2 (A)*	*7.3 (A)*
	Intersection		**-**	**-**	***6.9 (A)***	***7.0 (A)***
Retail Street and Silver Meteor Avenue*	NB	LTR	-	-	*7.2 (A)*	*6.6 (A)*
	SB	LTR	-	-	*7.4 (A)*	*7.5 (A)*
	EB	LTR	-	-	*7.1 (A)*	*7.2 (A)*
	WB	LTR	-	-	*7.4 (A)*	*7.3 (A)*
	Intersection		**-**	**-**	***7.3 (A)***	***7.3 (A)***
Retail Street and Evans Lane*	NB	LTR	-	-	*7.1 (A)*	*7.4 (A)*
	SB	LTR	-	-	*7.0 (A)*	*7.1 (A)*
	EB	LTR	-	-	*6.6 (A)*	*6.7 (A)*
	WB	LTR	-	-	*7.1 (A)*	*7.1 (A)*
	Intersection		**-**	**-**	***6.8 (A)***	***7.1 (A)***
Retail Street and Wesmond Drive*			-	-	*n/a*	*n/a*

"-" - intersection or movement not considered in current scenario / *Analyzed in Synchro

Queuing

The VISSIM reported average and maximum queue results are shown in **Table 7-2**. 95th percentile queuing results are presented for intersections not analyzed in VISSIM.

Along US Route 1, there are locations that experience significant queuing. Significant maximum queuing at key study intersections include:

- Eastbound approach of the intersection of US Route 1 and E. Glebe Road
- Westbound approach of the intersection of US Route 1 and Potomac Avenue
- Southbound and eastbound approaches of the intersection of US Route 1 and E. Reed Avenue
- Northbound approach of the intersection of US Route 1 and Slaters Lane.

Vehicle queues at these key intersections have the potential to spill back to upstream intersections and negatively impact traffic operations. Along Potomac Avenue, vehicle queuing is generally not an issue. Average and maximum approach and turn lane queues are generally contained within block lengths and storage lengths at intersections in the vicinity of the site.

Table 7-2: Full Build-Out Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
US Route 1 and S. Glebe Road	NB US Route 1	LT	580	91 (277)	136 (428)	90 (272)	125 (447)
		TH	860	85 (523)	68 (473)	87 (562)	49 (399)
		RT	360	99 (550)	81 (500)	101 (588)	60 (426)
	SB US Route 1	LT	350	108 (415)	114 (884)	128 (493)	59 (456)
		TH	1000	108 (457)	917 (1394)	134 (548)	1276 (1401)
		RT	280	2 (82)	489 (1379)	2 (82)	603 (1434)
	EB S Glebe	LT	180	177 (562)	1191 (1912)	188 (588)	1834 (1914)
		TH	580	177 (562)	1191 (1912)	188 (588)	1834 (1914)
		RT		41 (337)	1271 (1947)	60 (500)	1870 (1950)
	WB S Glebe	LT	150	9 (74)	29 (139)	19 (114)	186 (406)
		TH	590	63 (259)	50 (178)	61 (220)	94 (355)
		RT	170	38 (306)	7 (107)	34 (275)	9 (113)
US Route 1 and Potomac Yard Driveway opposite Alexandria Toyota	NB US Route 1	U-Turn	580	8 (68)	19 (100)	8 (68)	18 (91)
		LT		8 (68)	19 (100)	8 (68)	18 (91)
		TH	580	7 (148)	14 (243)	13 (191)	27 (262)
		RT		9 (172)	19 (269)	17 (217)	33 (288)
	SB US Route 1	LT	170	0 (0)	0 (0)	9 (95)	6 (90)
		TH	990	38 (338)	599 (964)	121 (571)	764 (992)
		RT		46 (368)	626 (994)	134 (601)	794 (1023)
	EB Toyota Driveway	LT	370	27 (148)	94 (368)	26 (149)	116 (382)
		TH		27 (148)	94 (368)	26 (149)	116 (382)
		RT		43 (177)	116 (396)	43 (177)	139 (411)
	WB Potomac Yard Dr	LT	390	20 (124)	16 (109)	26 (133)	14 (96)
		TH		20 (124)	16 (109)	26 (133)	14 (96)
		RT	220	17 (124)	16 (127)	18 (121)	16 (121)
US Route 1 and Luna Park Drive	NB	LT	170	0 (40)	6 (74)	2 (60)	7 (69)
		TH	520	5 (100)	2 (97)	6 (108)	4 (99)
	SB	TH	580	56 (291)	220 (308)	119 (304)	246 (313)
		RT		65 (331)	249 (348)	135 (344)	279 (353)
	EB	LT	150	36 (146)	10 (85)	37 (162)	12 (89)
		RT		1 (39)	2 (46)	1 (41)	2 (56)

Table 7-2: Full Build-Out Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
US Route 1 and E. Reed Avenue	NB	U-Turn	210	4 (117)	57 (387)	16 (296)	74 (385)
		LT		9 (153)	57 (387)	28 (331)	74 (385)
		TH	830	102 (362)	134 (380)	121 (366)	132 (387)
		RT	140	0 (4)	0 (2)	0 (17)	0 (2)
	SB	U-Turn	100	135 (405)	35 (312)	171 (425)	32 (272)
		LT		135 (405)	35 (312)	171 (425)	32 (272)
		TH	500	38 (394)	305 (428)	130 (420)	337 (430)
		RT		1 (66)	59 (395)	2 (61)	34 (367)
	EB	LT	1550	230 (949)	37 (340)	652 (1291)	37 (318)
		TH		229 (918)	81 (432)	766 (1294)	74 (432)
		RT	630	232 (920)	84 (434)	768 (1296)	77 (434)
	WB	LT	120	11 (97)	16 (141)	22 (124)	14 (108)
		TH	740	18 (141)	39 (234)	11 (90)	26 (189)
		RT		2 (56)	9 (117)	2 (54)	10 (115)
US Route 1 and Montrose Avenue	NB	LT	120	11 (273)	39 (341)	46 (329)	28 (302)
		TH	340	30 (334)	108 (344)	116 (344)	126 (347)
	SB	TH	580	20 (187)	72 (212)	85 (201)	95 (205)
		RT		28 (217)	88 (242)	104 (232)	115 (236)
	EB	LT	900	103 (279)	62 (267)	98 (278)	76 (265)
		RT		88 (260)	48 (247)	83 (259)	61 (246)
US Route 1 and Evans Lane	NB	U-Turn	130	5 (74)	7 (66)	6 (117)	7 (88)
		LT		5 (74)	7 (66)	6 (117)	7 (88)
		TH	780	19 (376)	142 (513)	137 (520)	218 (524)
		RT	180	14 (358)	130 (496)	126 (503)	204 (507)
	SB	U-Turn	130	37 (295)	57 (324)	139 (326)	56 (327)
		LT		37 (295)	57 (324)	139 (326)	56 (327)
		TH	270	35 (284)	153 (338)	40 (317)	196 (340)
		RT	40	28 (260)	139 (314)	34 (293)	180 (316)
	EB	LT	280	11 (90)	12 (104)	13 (104)	12 (120)
		TH		11 (90)	12 (104)	13 (104)	12 (120)
		RT		20 (117)	21 (130)	24 (131)	21 (146)
	WB	LT	130	18 (140)	77 (357)	24 (153)	165 (379)
		TH	360	18 (140)	77 (357)	24 (153)	165 (379)
		RT		11 (129)	67 (346)	16 (142)	155 (367)

Table 7-2: Full Build-Out Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
US Route 1 and E. Glebe Road	NB	U-Turn	350	22 (168)	74 (297)	21 (157)	69 (290)
		LT	350	22 (168)	74 (297)	21 (157)	69 (290)
		TH	1120	54 (313)	163 (339)	128 (333)	189 (336)
		RT		54 (313)	164 (341)	128 (333)	191 (339)
	SB	U-Turn	280	197 (392)	53 (273)	211 (400)	32 (192)
		LT		197 (392)	53 (273)	211 (400)	32 (192)
		TH	860	93 (397)	242 (417)	84 (394)	265 (413)
		RT		95 (401)	245 (421)	85 (398)	268 (417)
	EB	LT	660	139 (261)	105 (254)	191 (274)	170 (263)
		TH		41 (257)	18 (187)	56 (264)	27 (197)
		RT		8 (121)	12 (139)	15 (164)	13 (190)
	WB	LT	930	11 (100)	18 (131)	16 (135)	62 (383)
		TH		39 (231)	86 (380)	53 (303)	172 (397)
		RT	100	48 (244)	96 (393)	63 (317)	184 (411)
US Route 1 and Swann Avenue	NB	U-Turn	140	27 (233)	209 (399)	31 (379)	191 (400)
		LT		27 (233)	209 (399)	31 (379)	191 (400)
		TH	1200	75 (384)	167 (396)	165 (397)	209 (403)
		RT		76 (385)	168 (397)	166 (398)	210 (404)
	SB	U-Turn	190	94 (322)	28 (143)	93 (312)	23 (134)
		LT		94 (322)	28 (143)	93 (312)	23 (134)
		TH	1130	99 (321)	162 (329)	92 (325)	174 (333)
		RT		101 (325)	164 (333)	94 (328)	177 (336)
	EB	LT	150	47 (279)	46 (304)	46 (285)	52 (310)
		TH		24 (205)	20 (211)	24 (216)	20 (209)
		RT		26 (208)	21 (213)	26 (218)	21 (212)
	WB	LT	740	52 (253)	102 (270)	79 (261)	103 (272)
		TH		23 (227)	36 (257)	27 (249)	35 (257)
		RT		23 (227)	37 (257)	27 (249)	36 (258)
US Route 1 and Fannon Street	SB	TH	470	11 (183)	42 (208)	13 (192)	46 (201)
		RT		11 (183)	42 (208)	13 (192)	46 (201)
	EB	RT	300	4 (85)	34 (194)	4 (85)	31 (169)

Table 7-2: Full Build-Out Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
US Route 1 and E. Custis Avenue	NB	U-Turn	130	11 (71)	24 (201)	11 (104)	20 (200)
		LT		11 (71)	24 (201)	11 (104)	20 (200)
		TH	550	14 (235)	163 (341)	85 (322)	195 (336)
		RT		14 (240)	165 (346)	87 (327)	198 (341)
	SB	U-Turn	150	4 (50)	10 (112)	4 (49)	8 (61)
		LT		4 (50)	10 (112)	4 (49)	8 (61)
		TH	1190	42 (365)	318 (568)	50 (388)	331 (572)
		RT		42 (365)	323 (574)	50 (388)	336 (578)
	EB	LT	2290	64 (341)	104 (377)	81 (415)	95 (366)
		TH		32 (293)	71 (367)	46 (372)	57 (314)
		RT		32 (292)	72 (367)	46 (371)	57 (314)
	WB	LT	760	19 (142)	28 (206)	23 (151)	57 (237)
		TH		16 (149)	61 (236)	14 (144)	87 (235)
		RT		14 (152)	62 (239)	12 (147)	89 (238)
US Route 1 and E. Howell Avenue	NB	U-Turn	140	18 (115)	106 (311)	21 (190)	87 (293)
		LT		18 (115)	106 (311)	21 (190)	87 (293)
		TH	800	11 (150)	152 (317)	68 (294)	189 (313)
		RT		14 (164)	162 (332)	74 (309)	200 (327)
	SB	U-Turn	130	7 (75)	4 (47)	6 (77)	4 (44)
		LT		7 (75)	4 (47)	6 (77)	4 (44)
		TH	540	46 (253)	134 (266)	45 (251)	131 (268)
		RT		50 (264)	142 (277)	49 (262)	138 (279)
	EB	LT	2270	88 (349)	252 (453)	104 (378)	297 (453)
		TH		88 (349)	252 (453)	104 (378)	297 (453)
		RT		92 (355)	257 (458)	108 (384)	302 (459)
	WB	LT	600	16 (98)	135 (237)	26 (128)	166 (237)
		TH		16 (98)	135 (237)	26 (128)	166 (237)
		RT		0 (25)	1 (41)	1 (35)	0 (26)
US Route 1 and Potomac Avenue	NB	TH	990	976 (1133)	791 (1120)	867 (1130)	929 (1128)
		RT	140	933 (1087)	674 (1074)	811 (1084)	219 (869)
	SB	TH	740	34 (376)	133 (448)	30 (347)	130 (440)
	WB	LT	280	71 (299)	121 (352)	58 (268)	126 (360)
		RT	190	78 (312)	129 (366)	64 (282)	134 (374)
US Route 1 and Slaters Lane	NB	TH	1340	1056 (1252)	726 (1209)	990 (1251)	1048 (1256)
		RT	1040	153 (1025)	408 (1142)	93 (1143)	866 (1274)
	SB	LT	590	68 (373)	107 (894)	55 (360)	86 (879)
		TH	1060	16 (357)	70 (854)	20 (378)	48 (845)
	WB	RT	400	380 (435)	34 (280)	359 (429)	24 (306)

Table 7-2: Full Build-Out Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
Potomac Avenue and E. Reed Avenue	NB	LT	245	3 (40)	10 (142)	1 (33)	5 (94)
		TH		6 (227)	32 (235)	15 (366)	44 (302)
		RT		4 (215)	27 (223)	11 (355)	39 (291)
	SB	LT	235	0 (0)	0 (0)	3 (43)	5 (55)
		TH		25 (229)	128 (424)	40 (276)	52 (400)
		RT		33 (251)	144 (446)	49 (299)	63 (422)
	EB	LT	215	6 (85)	14 (129)	1 (25)	2 (47)
		TH		0 (14)	1 (57)	4 (98)	5 (81)
		RT		1 (41)	4 (75)	7 (117)	10 (100)
	WB	LT	215	0 (0)	0 (0)	4 (70)	4 (62)
		TH		0 (0)	0 (0)	4 (70)	4 (62)
		RT		0 (0)	0 (0)	9 (100)	8 (90)
Potomac Avenue and E. Glebe Road	NB	LT	110	2 (62)	4 (80)	1 (58)	1 (51)
		TH	1150	29 (327)	20 (273)	36 (328)	8 (154)
	SB	TH	1700	43 (386)	123 (468)	31 (359)	97 (458)
		RT		57 (443)	149 (524)	43 (416)	118 (515)
	EB	LT	860	22 (168)	32 (221)	32 (228)	27 (207)
		RT		30 (183)	42 (236)	41 (243)	36 (223)
Potomac Avenue and Swann Avenue	NB	LT	110	2 (89)	1 (72)	2 (71)	1 (40)
		TH	1090	22 (286)	15 (238)	24 (286)	9 (141)
	SB	TH	1120	4 (147)	65 (482)	5 (160)	52 (441)
		RT		4 (147)	65 (482)	5 (160)	52 (441)
	EB	LT	820	21 (142)	57 (295)	36 (199)	62 (305)
		RT		24 (145)	60 (298)	38 (202)	65 (308)
Potomac Avenue and E. Custis Avenue	NB	U-Turn	140	0 (10)	0 (32)	0 (5)	0 (28)
		LT		0 (10)	0 (32)	0 (5)	0 (28)
		TH	720	23 (334)	7 (146)	29 (387)	3 (87)
	SB	TH	1200	3 (110)	44 (445)	3 (79)	14 (267)
		RT		3 (128)	47 (463)	2 (97)	15 (286)
	EB	LT	850	16 (118)	22 (177)	31 (188)	24 (172)
		RT		21 (128)	26 (186)	37 (197)	29 (182)
Potomac Avenue and E. Howell Avenue	NB	U-Turn	150	6 (200)	7 (185)	10 (228)	3 (119)
		LT		6 (200)	7 (185)	10 (228)	3 (119)
		TH	800	6 (200)	7 (185)	10 (228)	3 (119)
	SB	U-Turn	540	1 (70)	40 (338)	2 (74)	12 (227)
		TH		1 (70)	40 (338)	2 (74)	12 (227)
		RT		1 (70)	40 (338)	2 (74)	12 (227)
	EB	LT	710	9 (99)	65 (272)	28 (179)	45 (253)
		RT		11 (104)	71 (277)	31 (184)	50 (258)

Table 7-2: Full Build-Out Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
Potomac Avenue and Main Line Boulevard	NB Mainline	LT	730	42 (330)	24 (320)	48 (373)	18 (297)
		TH		64 (338)	88 (367)	75 (379)	74 (360)
		RT		64 (338)	88 (367)	75 (379)	74 (360)
	SB Mainline	LT	700	31 (242)	109 (343)	24 (218)	157 (349)
		TH		31 (242)	109 (343)	24 (218)	157 (349)
		RT		31 (242)	109 (343)	24 (218)	157 (349)
	EB Potomac	LT	310	93 (318)	128 (317)	97 (318)	51 (315)
		TH		93 (318)	128 (317)	97 (318)	51 (315)
		RT		84 (303)	118 (302)	88 (304)	44 (300)
	WB Potomac	LT	300	7 (79)	94 (673)	8 (90)	97 (575)
		TH		6 (98)	224 (773)	5 (82)	145 (643)
		RT		6 (98)	224 (773)	5 (82)	145 (643)
Commonwealth Avenue & West Glebe Road/East Glebe Road*	NB	LTR	200	41	24	41	24
	SB	LTR	350	67	85	67	85
	EB	LTR	425	#319	193	#347	183
	WB	LTR	225	107	#357	106	#367
Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue*	NB	T	175	212	174	212	174
		R		22	0	22	0
	NEB	L	200	201	114	201	114
		T	200	#365	148	#365	148
	SB	T	525	182	298	182	298
		R	250	17	19	17	19
	SWB	T	50	173	#303	173	#303
	WB	L	625	0	0	0	0
US Route 1 and Livingston Avenue	NB	TH	200**	0 (37)	2 (151)	0 (51)	3 (189)
		RT		0 (37)	1 (139)	0 (43)	2 (176)
	WB	RT	325**	1 (42)	3 (66)	1 (42)	3 (68)
US Route 1 and Tide Lock Avenue	NB	TH	325**	1 (122)	1 (125)	1 (85)	1 (143)
		RT		0 (90)	0 (134)	0 (60)	0 (123)
	WB	RT	325**	2 (64)	3 (76)	2 (66)	5 (77)
US Route 1 and Silver Meteor Avenue	NB	TH	100**	17 (207)	32 (214)	40 (213)	45 (216)
		RT		17 (210)	32 (217)	41 (217)	45 (219)
	WB	RT	325**	6 (117)	237 (372)	18 (162)	339 (373)
US Route 1 and Wesmond Drive	NB	TH	300**	0 (69)	30 (416)	30 (362)	71 (431)
		RT		0 (33)	21 (353)	21 (299)	52 (368)
	WB	RT	325**	1 (47)	27 (170)	3 (55)	43 (228)

*Analyzed in Synchro / **Assumed Block and storage length for new intersections
- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 7-2: Full Build-Out Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
Main Line Boulevard and Livingston Avenue*	NB	LTR	300**	-	-	3	8
	EB	LTR	325**	-	-	0	0
	WB	LTR	350**	-	-	3	3
Main Line Boulevard and Tide Lock Avenue*	NB	LTR	325**	-	-	**8**	35
	SB	LTR	300**	-	-	**3**	3
	EB	LTR	325**	-	-	**0**	0
	WB	LTR	350**	-	-	**5**	3
Main Line Boulevard and E. Reed Avenue*	NB	LTR	350**	-	-	8	68
	SB	LTR	350**	-	-	20	15
	EB	LTR	325**	-	-	3	3
	WB	LTR	350**	-	-	3	0
Main Line Boulevard and Silver Meteor Avenue*	NB	LTR	400**	-	-	45	268
	SB	LTR	325**	-	-	110	170
	EB	LTR	325**	-	-	0	0
	WB	LTR	350**	-	-	5	15
Main Line Boulevard and Evans Lane*	NB	LTR	450**	-	-	m87	m51
	SB	LTR	350**	-	-	m174	126
	EB	LTR	350**	-	-	m11	188
	WB	LTR	325**	-	-	26	31
Main Line Boulevard and Wesmond Drive*	NB	LTR	325**	-	-	38	70
	SB	LTR	450**	-	-	108	220
	EB	LTR	325**	-	-	3	3
	WB	LTR	350**	-	-	3	5

"-" - intersection or movement not considered in current scenario / *Analyzed in Synchro / **Assumed Block and storage length for new intersections / m – Volume for 85th percentile queue is metered by upstream signal.

Table 7-2: Full Build-Out Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
Potomac Avenue and Livingston Avenue	NB	LT	150**	- (-)	- (-)	0 (0)	0 (0)
		TH	300**	- (-)	- (-)	19 (340)	10 (303)
		RT		- (-)	- (-)	11 (314)	5 (277)
	SB	LT	150**	- (-)	- (-)	2 (31)	1 (31)
		TH	300**	23 (275)	753 (1219)	31 (355)	76 (630)
		RT		23 (275)	753 (1219)	31 (355)	76 (630)
	EB	LT	350**	- (-)	- (-)	2 (33)	1 (24)
		TH		- (-)	- (-)	2 (33)	1 (24)
		RT		2 (48)	3 (51)	2 (44)	1 (36)
	WB	LT	200**	- (-)	- (-)	2 (40)	2 (37)
		TH		- (-)	- (-)	2 (40)	2 (37)
		RT		- (-)	- (-)	0 (23)	0 (19)
Potomac Avenue and Tide Lock Avenue	NB	LT	150**	- (-)	- (-)	8 (70)	16 (200)
		TH	325**	- (-)	- (-)	12 (259)	31 (291)
		RT		- (-)	- (-)	7 (243)	25 (275)
	SB	LT	150**	- (-)	- (-)	1 (28)	4 (84)
		TH	300**	24 (261)	194 (393)	37 (329)	105 (385)
		RT		33 (285)	213 (417)	48 (353)	119 (409)
	EB	LT	350**	- (-)	- (-)	17 (122)	16 (121)
		TH		- (-)	- (-)	17 (122)	16 (121)
		RT		2 (70)	9 (136)	14 (107)	13 (107)
	WB	LT	325**	- (-)	- (-)	3 (90)	4 (95)
		TH		- (-)	- (-)	3 (90)	4 (95)
		RT		- (-)	- (-)	5 (93)	6 (106)
Potomac Avenue and Silver Meteor Avenue	NB	LT	150**	- (-)	- (-)	72 (483)	8 (98)
		TH	400**	- (-)	- (-)	120 (496)	41 (290)
		RT		- (-)	- (-)	111 (481)	33 (275)
	SB	LT	150**	- (-)	- (-)	13 (316)	68 (419)
		TH	325**	56 (315)	118 (441)	107 (426)	102 (434)
		RT		56 (315)	118 (441)	107 (426)	102 (434)
	EB	LT	350**	- (-)	- (-)	21 (234)	112 (267)
		TH		0 (0)	- (-)	21 (234)	112 (267)
		RT		6 (107)	22 (185)	23 (250)	128 (283)
	WB	LT	125**	- (-)	- (-)	12 (123)	32 (137)
		TH		- (-)	- (-)	12 (123)	32 (137)
		RT		- (-)	- (-)	9 (116)	27 (131)

"-" - intersection or movement not considered in current scenario / **Assumed Block and storage length for new intersections

Table 7-2: Full Build-Out Average (Maximum) Queuing Analyses (feet)							
Intersection	Approach	Mvmt	Block or Storage Length	2010 Plan		Updated Plan	
				AM	PM	AM	PM
Potomac Avenue and Evans Lane	NB	LT	150**	5 (61)	6 (59)	5 (92)	0 (0)
		TH	325**	25 (380)	14 (200)	52 (401)	21 (275)
		RT		- (-)	- (-)	41 (381)	14 (255)
	SB	LT	150**	- (-)	- (-)	13 (136)	6 (139)
		TH	400**	16 (315)	53 (485)	19 (338)	87 (485)
		RT		12 (300)	45 (471)	13 (323)	76 (470)
	EB	LT	350**	5 (80)	5 (102)	9 (103)	6 (91)
		TH		- (-)	- (-)	9 (103)	6 (91)
		RT		9 (112)	10 (134)	18 (135)	12 (123)
	WB	LT	125**	- (-)	- (-)	1 (24)	2 (55)
		TH		- (-)	- (-)	1 (24)	2 (55)
		RT		- (-)	- (-)	0 (20)	1 (52)
Potomac Avenue and Wesmond Drive	NB	LT	150**	- (-)	- (-)	39 (509)	4 (78)
		TH	425**	- (-)	- (-)	87 (540)	15 (202)
		RT		- (-)	- (-)	73 (504)	6 (167)
	SB	LT	150**	- (-)	- (-)	0 (0)	0 (0)
		TH	350**	7 (117)	18 (364)	12 (216)	12 (268)
		RT		12 (146)	28 (394)	19 (245)	19 (297)
	EB	LT	425**	- (-)	- (-)	7 (106)	75 (219)
		TH		- (-)	- (-)	7 (106)	75 (219)
		RT		14 (122)	18 (146)	11 (125)	89 (238)
	WB	LT	100**	- (-)	- (-)	7 (99)	19 (194)
		TH		- (-)	- (-)	7 (99)	19 (194)
		RT		- (-)	- (-)	7 (99)	19 (194)
Tide Lock Avenue and Livingston Avenue	SB	LTR	300**	-	-	3	3
	EB	LTR	225**	-	-	0	0
	WB	LTR	350**	-	-	3	3
Retail Street and E. Reed Avenue	NB	LTR	325**	-	-	3	0
	SB	LTR	200**	-	-	3	3
	EB	LTR	125**	-	-	3	5
Retail Street and Silver Meteor Avenue	NB	LTR	400**	-	-	3	0
	SB	LTR	325**	-	-	0	0
	EB	LTR	125**	-	-	3	5
	WB	LTR	150**	-	-	5	5
Retail Street and Evans Lane	NB	LTR	175**	-	-	3	5
	SB	LTR	400**	-	-	3	3
	EB	LTR	125**	-	-	5	3
	WB	LTR	575**	-	-	0	0
Retail Street and Wesmond Drive				-	-	n/a	n/a

"-" - intersection or movement not considered in current scenario / **Assumed Block and storage length for new intersections

Travel Time

Travel time field simulation results are presented in **Table 7-3**. Travel time is generally consistent for US Route 1 and Potomac Avenue for both directions of travel. The travel time results indicate that the Updated Plan will generally be similar to the 2010 Plan. It is noted that even as travel times increase along US Route 1, travel times are relatively stable along Potomac Avenue. This suggests that Potomac Avenue may have excess capacity to accommodate additional diversions of trips from US Route 1. This would serve to reduce some congestion along US Route 1, improving traffic operations at all US Route 1 intersections and bringing the parallel roads to a better balance.

Table 7-3: Full Build-Out Travel Time (minutes)

Location / Direction	2010 Plan		Updated Plan	
	AM	PM	AM	PM
US Route 1 Northbound	4.0	8.6	6.3	10.5
US Route 1 Southbound	4.5	10.1	5.7	12.4
Potomac Avenue Northbound	4.8	5.3	5.3	5.5
Potomac Avenue Southbound	6.0	7.7	6.2	6.6

7.7 2040 FULL BUILD-OUT CONDITIONS SUMMARY

With the addition of traffic generated by the full build-out of the Updated Plan for North Potomac Yard, the results indicate that generally the vast majority of intersections will operate at acceptable LOS D or better and the plan will result in traffic impacts that are similar to those of the 2010 Plan.

There are several intersections with overall LOS E or that have high side street approach delays. It is likely however, the some of these instances as noted in this study could have been the result of the over assignment of vehicle trips to certain movements. Regardless, it is recommended that for the area to continue to accommodate increases in development and to maintain an adequately functioning transportation network, measures to increase non-auto mode share along with strategic vehicle capacity-enhancing modifications to area streets and intersections should be implemented. It is also recommended that traffic signal timing adjustments be considered, in conjunction with other improvements, to provide the desired level of through vehicle progression while serving side streets and pedestrian crossing movements. Further, it is recognized that interjurisdictional cooperation would be needed to address the traffic impacts at the intersection of S. Glebe Road and US Route 1.

It is noted that as traffic volumes grow year over year, drivers will become more familiar with recurring congestion and opportunities for diversion. It is expected that Potomac Avenue will fulfill its intended use as a viable parallel route to US Route 1 and serve to balance traffic impacts and congestion between the two roads. The analyses discussed herein cannot account for all the diversions associated with driver behavior and familiarity; instead they demonstrate that such diversions (even at the conservative scale used in this analysis) can have beneficial impacts on US Route 1 while not greatly impacting Potomac Avenue, which is important both for personal auto drivers and all other roadway users.

8. Multimodal Transportation Recommendations

This chapter presents the transportation recommendations in support of the redevelopment of North Potomac Yard. This includes planned and programmed City of Alexandria initiatives as well as improvement to existing intersections that were identified in past studies in the area:

- Lane configuration improvements at US Route 1 and E. Reed Avenue, US Route 1 and E. Glebe Road, US Route 1 and Swann Avenue, and US Route 1 and Custis Avenue
- New signalized intersections (Montrose Avenue and Fannon Street [pedestrian only])
- New north-south roadway between Oakville Triangle property and E. Glebe Road to enhance connectivity along west side of US Route 1.
- Traffic signal timing updates
- Extension of dedicated lanes for the Metroway with any meaningful redevelopment on the North Potomac Yard Property
- Development of Potomac Yard Metrorail Station
- Transit signal priority along US Route 1

This also includes improvements to the roadway network that have been identified or refined as part of this current study:

- Lane configuration improvements at US Route 1 and Potomac Avenue to allow westbound vehicles to more efficiently turn from Potomac Avenue to US Route 1 southbound
- Lengthen northbound and southbound left turn storage lanes along US Route 1 at select locations to minimize potential for turn lanes vehicle to be blocked by through vehicles or through lanes to be blocked by turning vehicles. Preliminarily, the intersections of US Route 1 and E. Glebe Road and with E. Reed Avenue have been identified for consideration.
- Increase traffic signal cycle length to 160 seconds along US Route 1.
- Revise signal phasing and green times to provide the necessary green time for northbound and southbound through movements along US Route 1 as required for the heavy commuter orientation of the street, while providing the desired side street level of service.
- Consider the application of northbound and southbound lagging left turns along US Route 1 to improve north-south progression.
- Consider coordinating the signals of US Route 1 and Potomac Avenue and Potomac Avenue and Main Line Boulevard to minimize queue build up at Main Line Boulevard.
- Signalized intersection at frequent intervals along Potomac Avenue to facilitate pedestrian crossings and site access.

Additionally, a statement regarding the proposed development impacts on homeland security emergency evacuation is located in **Appendix K**.

9. Conclusion

The existing conditions traffic analysis shows that the area generally operates well during the AM and PM peak hours. The local street network to the west and south of US Route 1, the developing grid network of streets in the Potomac Yard, and the growing use of Potomac Avenue as a viable north-south alternative provide convenient opportunities for vehicle, pedestrian, bicycle, and transit travel. The interconnected network of streets allows for the efficient dispersion of traffic, reducing the automobile pressure along US Route 1 and allowing the signalized and unsignalized intersections in the area to operate efficiently.

It is noted that today the area is predominately auto-oriented with an emphasis on north-south travel. Accordingly, high levels of side street delays and minimal on-street bicycle facilities are the tradeoff.

This study has demonstrated that the Updated Plan for North Potomac Yard yields results that are similar to the 2010 Plan. Traffic impacts are consistent and many of the same recommendations still apply. The 2021 Phase I analysis results and the 2040 full build-out analysis results show that the vast majority of intersections will operate at LOS D or better with the Updated Plan

Specific intersections where operations are forecasted to be LOS E or F under the Updated Plan are also forecasted to do so under the 2010 Plan. It is likely however, the some of the instances of LOS E or F noted in this study could have been the result of the over assignment of vehicle trips to certain movements. With many other intersections in the area operating at LOS D or better, particularly along Potomac Avenue, there appear to be opportunities for drivers to find the path of least resistance with regards to travel along the two roadways. The strength of the grid network of streets is that it provides alternate paths beyond those considered in this conservative analysis.

What was true in 2010 is even more so now: the redevelopment of North Potomac Yard represents a significant enhancement to the built environment and the multimodal character of US Route 1. North Potomac Yard will become a destination for residents, employers and employees, and transit riders. Safe, efficient, and direct transportation in and around North Potomac Yard will be essential for pedestrians, bicyclists, transit riders, and auto drivers.

The Updated Plan considers and provides for the travel of pedestrians, cyclists, transit riders, and motorists, in that order. This is evident in many of the design principles of the Updated Plan: the proposed urban scale blocks, the frequent crossing opportunities at signalized intersections (with pedestrian signal indications and high visibility crosswalks), the low speed roadways, the enhanced sidewalk and trail network, the incorporation of the Metroway onto plan area streets and dedicated transit lanes along Potomac Avenue, the support of and accessibility to the Potomac Yard Metrorail station, and the identification of on- and off-street bicycle facilities.

The redevelopment of North Potomac Yard is poised to operate with a commitment to multimodal transportation service and to support the reshaping of the travel in one of the City's most important areas.