OAKVILLE TRIANGLE AND ROUTE 1 CORRIDOR PLANNING STUDY AREA

MULTIMODAL TRANSPORTATION STUDY

PREPARED FOR:

STONEBRIDGECARRAS, LLC.

MARCH 6, 2015 | FINAL REPORT

Prepared By:

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1. Introduction and Executive Summary

1.1 OVERVIEW

As the east side of US Route 1 is being redeveloped, the City of Alexandria has focused attention to the parcels on the west side of Route 1 and is embarking on an effort to plan for the potential redevelopment of these parcels.

Oakville Triangle is the most significant and only tract along the west side of Route 1 that is positioned for redevelopment, while the balance of the land along the west side of Route 1 will require assemblage to undertake any meaningful increase in density,. Oakville Triangle is envisioned as an urban, walkable, mixed-use development. At full build-out, the Oakville Triangle is currently planned to contain approximately the following: a 150-room hotel, 1,074 mid-rise apartment units, 85,440 square feet of small format specialty retail uses, and 56,900 square feet of high-turnover restaurant uses.

The City of Alexandria recognizes the redevelopment potential of other parcels along the west side of US Route 1. The City of Alexandria estimates that by 2027, these parcels have the potential to be redeveloped into 70,000 square feet of commercial development and 720,000 square feet of residential development. Collectively, the Oakville Triangle and these remaining parcels along the west side of US Route 1 are known as the Route 1 Corridor Planning Study Area.

StonebridgeCarras and IndCor, the owner of the approximately 13-acre Oakville Triangle parcel that extends from Fannon Street to Calvert Avenue, are working with the City to develop the design principles and guidelines for the remaining Route 1 Corridor Planning Study Area. The planning process is expected to result in a Master Plan Amendment of the existing Potomac West Small Area Plan, which includes the areas containing the Oakville Triangle and the remaining Route 1 Corridor Planning Study Area parcels.

As a part of the collaboration between StonebridgeCarras and the City of Alexandria, this multimodal transportation analysis was prepared to study the existing and future transportation conditions of US Route 1 and affected neighborhood streets in the context of a redeveloped Oakville Triangle and Route 1 Corridor Planning Study Area.

This report documents and analyzes existing transportation conditions, future conditions without development (including future transportation improvements, regional growth in traffic, traffic generated by nearby approved and unbuilt developments), and future conditions with development. The study makes recommendations for transportation demand management, streets, transit, bicycles, and pedestrians related to the Oakville Triangle and Route 1 Corridor Planning Study Area.

1.2 STUDY PURPOSE

This study was performed concurrently with the land use plan development effort for Oakville Triangle to make recommendations for the future multimodal transportation network. The resulting transportation recommendations may become incorporated in a “small-small area plan” for the Route

1 Corridor Planning Study Area. This study was prepared in accordance with the City's Transportation Planning Administrative Guidelines – Multimodal Transportation Studies (March 2013).

This study also complies with *Virginia Department of Transportation (VDOT) Traffic Impact Analysis Regulations 24 VAC 30-155* under Chapter 527 of the 2006 Code of Virginia.

1.3 PUBLIC INVOLVEMENT

StonebridgeCarras, on behalf of the owner of the approximately 13-acre Oakville Triangle property, agreed to fund consultant services and staffing such that the City could begin the Route 1 Corridor planning efforts. Both the City and the developer view the community as a vital asset and resource in developing the "small-small area plan" principles for the study area, helping to establish a unified streetscape for Route 1, and an integrated approach to potential redevelopment along Route 1. A nine-member Oakville Triangle and Route 1 Corridor Advisory Group was established by the City Council on March 11, 2014. The Advisory Group provides advice to City staff on the planning and associated regulatory submissions for Oakville Triangle and the Route 1 Corridor, specifically assisting in developing Plan principles regarding potential land uses, open space, sustainability, transportation and connectivity issues, and potential community benefits.

1.4 EXECUTIVE SUMMARY

Site Location

The Oakville Triangle and Route 1 Corridor Planning Study Area parcels are located in the northeast corner of Alexandria. Arlington County and Four Mile Run are located to the north, the Potomac Yard Landbays and the Potomac River are located to the east, the residential neighborhoods of Lynhaven and Del Ray are located to the west and to the immediate south, and Old Town Alexandria is located further south. The Oakville Triangle and the other Route 1 Corridor Planning Study Area parcels are shown in regional context in ***Figure 1-1: Regional Context Map*** and in greater detail in ***Figure 1-2: Route 1 Corridor Planning Study Area*****.**

Description of Proposed Development

The land use scenarios described in this report for the Oakville Triangle are based on the development concept plans at the inception of this traffic study (June 2014). It is recognized that as the public involvement process continues, the developers of the Oakville Triangle and the City of Alexandria may refine the concepts and development levels. However, it is anticipated that the resulting density and land uses will be within the scope and magnitude of the overall quantities analyzed in this study. The full build-out approximate development quantities analyzed in this study for the Oakville Triangle are as follows:

- 1,074 dwelling units (primarily mid-rise apartments)
- 150-room Hotel
- 85,440 square feet of small-format specialty retail
- 56,960 square feet of high-turnover restaurant

The proposed development program for the Oakville Triangle will replace the existing 446,290 square foot mix of retail, services, and light industrial uses that currently exist on the site.

Figure 1-1: Regional Context Map

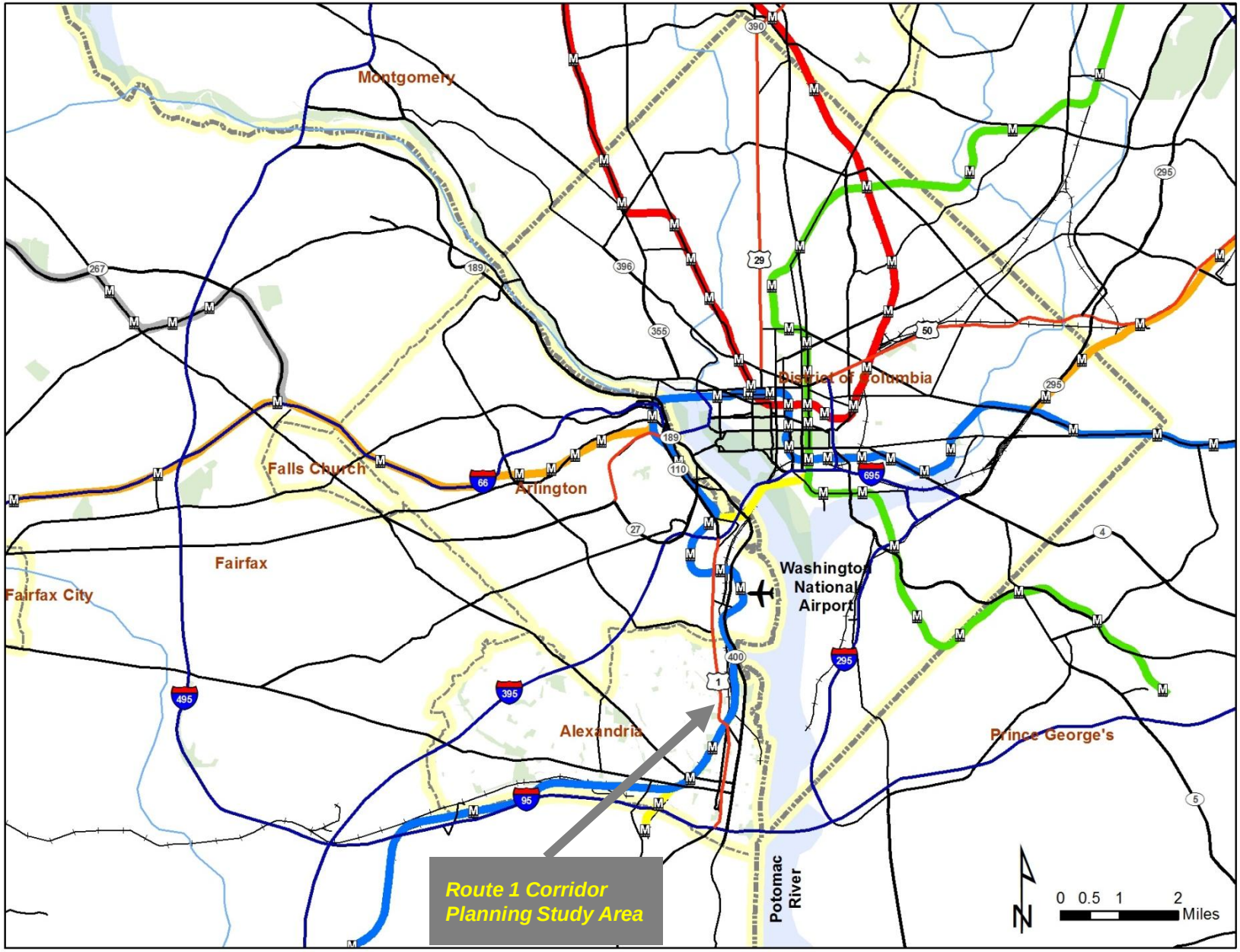
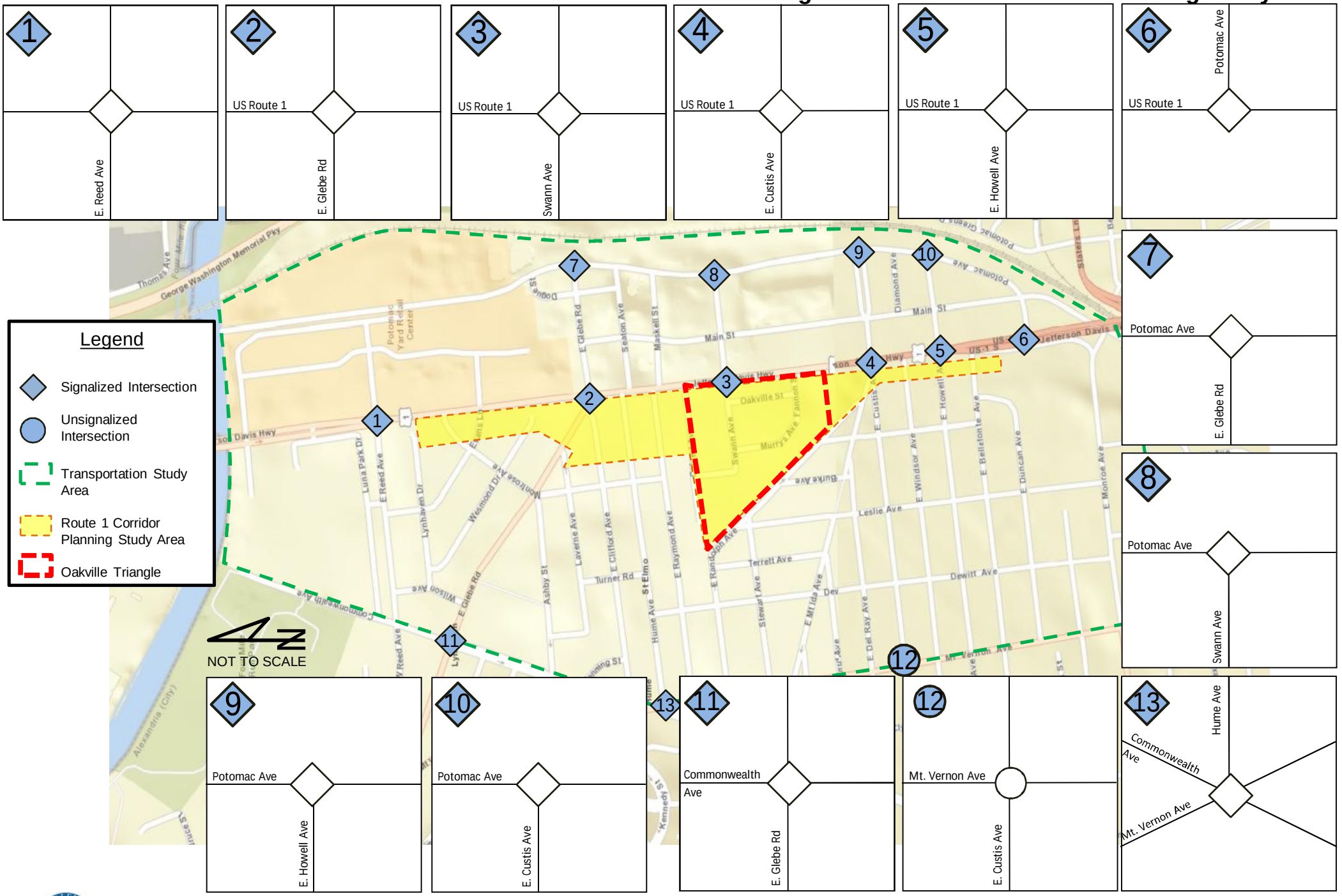


Figure 1-2: Route 1 Corridor Planning Study Area



The land use scenarios described in this report for the remaining non-Oakville Triangle parcels in the Route 1 Corridor Planning Study Area are based on information and forecasts provided by the City of Alexandria's Planning and Zoning Department. Development projections for the non-Oakville Triangle portions of the Route 1 Corridor Planning Study Area parcels are based on 90 percent residential and 10 percent commercial uses. For the purposes of this analysis, the trip generation of the commercial components of the Route 1 Corridor Planning Study Area assumes all commercial is retail, as directed by City Staff. It should be noted that the development projections were provided for use by the City based on what can be considered to be a maximum planning level forecast of the potential future development using information currently available. The forecasts assume that significant assemblage occurs in the 51 commercial properties owned by 41 owners in the remaining non-Oakville Triangle portion of the study area. Further, the development projections are subject to the ongoing community planning process. The potential development quantities analyzed in this study for the remaining parcels of the Route 1 Corridor Planning Study Area include 70,000 square feet of commercial land use (office and retail) and 720,000 square feet of residential land use (multifamily and townhouse, resulting in 576 residential units).

Study Methodology and Assumptions

Study Guidelines and General Information

This multimodal transportation study has been prepared to conform to the City of Alexandria's Transportation Planning Administrative Guidelines. Per the guidelines, a scoping agreement was prepared with the assistance of the City of Alexandria's Department of Transportation and Environmental Services (T&ES). This study has also been prepared to conform to certain previous assumptions of the completed Potomac Yard Multimodal Transportation Study (June 2010). The assumptions in that study have been previously reviewed and approved by both the City of Alexandria and the Virginia Department of Transportation; as such, the City has expressed a desire to continue to use the appropriate assumptions in order to maintain a level of consistency between the analyses performed for the Potomac Yard Multimodal Transportation Study and this analysis. Four analysis years are considered in this study: 2014 (the existing conditions year), 2018 (the year of Phase 1 build-out of the Oakville Triangle property), 2021 (the year of full build-out of the Oakville Triangle property), and 2027 (the horizon year up to which additional traffic generated by the remaining parcels of the Route 1 Corridor Planning Study Area are forecast). Thirteen study intersections were considered for analysis:

1. U.S. 1 and E. Reed Avenue
2. U.S. 1 and E. Glebe Road
3. U.S. 1 and Swann Avenue
4. U.S. 1 and E. Custis Avenue
5. U.S. 1 and E. Howell Avenue
6. U.S. 1 and Potomac Avenue
7. Potomac Avenue and E. Glebe Road
8. Potomac Avenue and Swann Avenue
9. Potomac Avenue and E. Custis Avenue
10. Potomac Avenue and E. Howell Avenue
11. Commonwealth Avenue and E. Glebe Road
12. Mt. Vernon Avenue and E. Custis Avenue
13. Commonwealth Avenue and Mt. Vernon Avenue

The City directed that intersection capacity analyses be performed using Highway Capacity Manual methodologies and Synchro software. Vehicle queuing at study intersections is also reported in the Appendix.

Existing Traffic Volumes

Traffic counts were conducted at the study area intersections on weekdays in April 2014 between 6:30 AM and 9:30 AM and between 4:00 PM and 7:00 PM. The network peak hours of study were identified as 7:45 AM to 8:45 AM for the morning peak and 5:15 PM to 6:15 PM for the afternoon peak. Peak hour traffic volumes, bicycle volumes, pedestrian volumes, peak hour factors, and heavy truck percentages were calculated for these network peak hours and incorporated into the analysis.

Existing traffic associated with the current uses on the Oakville Triangle property were determined based on the existing peak hour turning movement counts at the Route 1 and Swann Avenue intersection. The turning movement volumes in to and out of the Oakville Triangle at this intersection were assumed to represent one-half of the total trip generation for the current uses of the Oakville Triangle property. Accordingly, the total traffic generated by the current uses of the Oakville Triangle Property was assumed to be twice the existing turning movements at the Swann Avenue intersection. The total traffic generated by the current uses of the Oakville Triangle was removed from the network for the future scenario where the Oakville Triangle is redeveloped (i.e. an existing trip credit is assumed for the redevelopment of these uses).

Future Traffic Network

The following are planned transportation improvements that are anticipated to be completed, open, and operational prior to the 2018 study year:

- The Metroway, a center running bus rapid transit (BRT) line that travels in dedicated lanes along Route 1.
- The Potomac Yard Metrorail Station, a new station for the regional Metrorail system is planned to be located east of Potomac Yard.
- East Reed Avenue Intersection Improvements, improvement to the lane configurations at the intersection of Reed Avenue and Route 1 including an exclusive southbound right turn lane and the modification of the east and west approaches to allow thru movements

Future Traffic Volumes

Despite the lack of apparent traffic increases along US Route 1, a conservative one percent per year growth factor was applied to the existing turning movement volumes, up to a maximum growth of 10 percent. This one percent yearly growth factor is consistent with the factor used in the Potomac Yard Multimodal Transportation Study. This general growth is intended to reflect increases in traffic attributable to nonspecific growth in the City and currently unknown development in the vicinity of the Route 1 corridor. Consistent with the Potomac Yard Multimodal Transportation Study, this factor was applied only to northbound and southbound thru movements along US Route 1.

The Oakville Triangle portion of the Route 1 Corridor Planning Study Area is assumed to be partially developed in 2018 and fully built-out in 2021.

Planning level forecast of the land uses and quantities of the remaining "By-Others" development of the Route 1 Corridor Planning Study were provided by the City of Alexandria Planning and Zoning Department. Generalized development forecasts were provided for 2021 and 2027.

Person-trip generation figures for approved and unbuilt developments, the Oakville Triangle, and the Route 1 Corridor Planning Study Area are based on the trip generation rates and equations found in the 9th Edition of the Institute of Transportation Engineers' Trip Generation Manual.

The mode split assumptions developed for the Potomac Yard Multimodal Transportation study were applied to this analysis. This mode split recognizes the redevelopment of Route 1 as a transit-oriented corridor and the proximity of the proposed development to the future Metrorail station. As a result, a percentage of the trip generation in the study area is assumed to be accommodated by regional (Metrorail) and local transit (DASH, Metrobus, Metroway), pedestrian and bicycle, and by autos. The appropriate mode split percentage assumptions were applied to the person-trip generation of approved and unbuilt developments, the Oakville Triangle, and the remaining Route 1 Corridor Planning Study Area parcel on the basis of proximity to a Metrorail station and land use. Per the assumptions of the Potomac Yard Multimodal Transportation Study, the resulting person-trips by auto were taken to also represent the number of vehicle based trips (i.e. an assumed auto occupancy of 1.0).

It was determined that the internal capture of trips between land uses in the Route 1 Corridor Planning Study Area is contained within the pedestrian and bicycle mode split percentages. No other internal capture of trips is assumed for the study area.

A pass-by factor of 43% was applied to the PM peak hour trips for the restaurant land uses of the Oakville Triangle and relevant approved and unbuilt restaurant land uses. This represents the average pass-by factor for the High-Turnover Sit-Down Restaurant land use as contained in the ITE Trip Generation Handbook. No other land uses were assigned a pass-by factor in this study.

The existing peak hour factors (PHF) were increased according to the methodologies of the City of Alexandria's Transportation Planning Administrative Guidelines and do not exceed the VDOT recommended maximum of 0.95 for future scenarios. Pedestrian volumes, bicycle volumes, and heavy vehicle percentages are consistent with those used for the existing conditions analysis.

Principal Findings, Conclusions and Recommendations

Existing Conditions – The analysis shows that all study intersections operate at an overall LOS of D or better during both the AM and PM peak hours. The local street network to the west, north, and south of Route 1, the developing grid network of streets in the Potomac Yard east of US Route 1, and the opening of Potomac Avenue as a viable north-south alternative provide convenient opportunities for vehicle, pedestrian, bicycle, and transit travel due to the interconnected nature of the network.

The interconnected network of streets allows for the efficient dispersion of traffic, reducing the automobile pressure along the Route 1 corridor and allowing the signalized and unsignalized intersections in the area to operate efficiently.

It should be noted that there are side street approaches and movements that operate at LOS E or F. The 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 traditional (DASH and Metrobus) and enhanced (Metroway) transit options, the City has prioritized the efficient operations of the north-south movements. This approach is not uncommon in urban corridors.

The overall intersection level of service summary for existing conditions is shown in Table 1-1.

Table 1-1: Existing Traffic Analysis Summary (Pre-Mitigation)
LOS (sec/veh)

Intersection	LOS (Delay)	
	AM	PM
1. US Route 1 & East Reed Avenue	***C (21.2)***	***C (26.9)***
2. US Route 1 & East Glebe Road	***C (34.4)***	***B (17.5)***
3. US Route 1 & Swann Avenue	***A (7.1)***	***A (8.4)***
4. US Route 1 & East Custis Avenue	***B (10.4)***	***A (7.4)***
5. US Route 1 & East Howell Avenue	***B (12.3)***	***A (5.7)***
6. US Route 1 & Potomac Avenue	***A (9.5)***	***B (11.4)***
7. Potomac Avenue & East Glebe Road	***A (2.9)***	***A (4.1)***
8. Potomac Avenue & Swann Avenue	***A (5.6)***	***A (5.2)***
9. Potomac Avenue & East Custis Avenue	***A (5.6)***	***A (3.8)***
10. Potomac Avenue & East Howell Avenue	***A (2.2)***	***A (0.1)***
11. Commonwealth Avenue & West Glebe Road/East Glebe Road	***B (17.6)***	***B (15.8)***
12. Mt. Vernon Avenue & East Custis Avenue *(Unsignalized)*	***B (10.9)***	***B (11.6)***
13. Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue	***D (38.5)***	***D (36.0)***

Future Conditions without Development – The analysis of future conditions without development considers the combined effects of the additional traffic generated by currently approved and unbuilt developments, regional traffic growth, and programmed transportation improvements.

Analysis results indicated that while most study intersectionS will continue to operate at LOS D or better, beginning in 2021 the intersections of Glebe Road and Reed Avenue with US Route 1 will operate at LOS of E or F in one or both peak hours. This gives an indication of intersections that may need operational improvements to operate at an acceptable level of service when considering future traffic volumes without development. The overall intersection level of service summary for future traffic without development is shown in Table 1-2.

Table 1-2: Future Without Development Traffic Analysis Summary (Pre-Mitigation) LOS (sec/veh)						
Intersection	2018 Conditions		2021 Conditions		2027 Conditions	
	AM	PM	AM	PM	AM	PM
1. US Route 1 & East Reed Avenue	D (50.5)	C (32.4)	F (83.8)	D (42.2)	F (141.7)	E (74.9)
2. US Route 1 & East Glebe Road	C (33.8)	B (16.8)	E (69.1)	C (22.9)	F (125.7)	E (59.9)
3. US Route 1 & Swann Avenue	A (6.9)	A (8.6)	A (9.4)	B (13.3)	C (27.8)	B (19.4)
4. US Route 1 & East Custis Avenue	B (10.3)	A (7.4)	B (12.9)	A (8.4)	D (44.5)	B (10.2)
5. US Route 1 & East Howell Avenue	B (12.1)	A (8.8)	B (13.2)	A (9.5)	C (27.3)	B (12.5)
6. US Route 1 & Potomac Avenue	B (10.9)	B (10.8)	B (13.1)	B (13.6)	D (40.6)	B (19.6)
7. Potomac Avenue & East Glebe Road	A (3.3)	A (4.8)	A (4.3)	A (7.3)	A (5.3)	A (9.1)
8. Potomac Avenue & Swann Avenue	A (5.6)	A (5.5)	A (6.1)	A (8.7)	A (6.6)	B (10.6)
9. Potomac Avenue & East Custis Avenue	A (5.9)	A (4.2)	A (5.8)	A (4.2)	A (5.8)	A (4.2)
10. Potomac Avenue & East Howell Avenue	A (2.6)	A (2.5)	A (2.7)	A (2.4)	A (2.8)	A (2.3)
11. Commonwealth Avenue & West Glebe Road/East Glebe Road	B (16.8)	B (15.5)	B (17.1)	B (16.1)	B (17.9)	B (17.4)
12. Mt. Vernon Avenue & East Custis Avenue *(Unsignalized)*	B (11.1)	B (12.1)	B (11.4)	B (12.5)	B (12.0)	B (13.3)
13. Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue	D (36.8)	C (34.5)	D (36.8)	C (34.5)	D (36.8)	C (34.5)

Future Conditions with Development - Analysis results indicated that while most study intersections will continue to operate at LOS D or better, beginning in 2021 the intersections of Glebe Road and Reed Avenue with US Route 1 will operate at LOS of E or F in one or both peak hours. In 2027, both the intersections of Swann Avenue and Custis Avenue with US Route 1 will also operate at LOS of E or F in one or both peak hours . This gives an indication of intersections that may need operational improvements to operate at an acceptable level of service when considering future traffic volumes with development. The overall intersection level of service summary with development for existing intersection configurations is shown in Table 1-3.

Table 1-3: Future With Development Traffic Analysis (Pre-Mitigation) LOS (sec/veh)						
Intersection	2018 Conditions		2021 Conditions		2027 Conditions	
	AM	PM	AM	PM	AM	PM
1. US Route 1 & East Reed Avenue	D (54.4)	C (32.6)	F (100.9)	D (50.8)	F (159.9)	F (89.4)
2. US Route 1 & East Glebe Road	D (36.4)	B (18.0)	F (83.4)	D (35.2)	F (148.6)	F (91.4)
3. US Route 1 & Swann Avenue	A (9.7)	B (11.7)	C (25.6)	C (29.4)	E (70.7)	D (54.4)
4. US Route 1 & East Custis Avenue	B (10.5)	A (6.7)	B (15.7)	A (7.5)	E (62.7)	B (12.6)
5. US Route 1 & East Howell Avenue	B (12.2)	A (8.9)	B (16.6)	B (11.7)	D (39.5)	B (16.9)
6. US Route 1 & Potomac Avenue	B (10.9)	B (10.5)	B (13.7)	B (13.1)	D (46.5)	B (19.6)

Table 1-3: Future With Development Traffic Analysis (Pre-Mitigation) LOS (sec/veh)						
Intersection	**2018 Conditions**		**2021 Conditions**		**2027 Conditions**	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**
7. Potomac Avenue & East Glebe Road	***A (3.3)***	***A (4.8)***	***A (4.4)***	***A (7.3)***	***A (5.6)***	***A (9.2)***
8. Potomac Avenue & Swann Avenue	***A (6.0)***	***A (5.8)***	***A (6.9)***	***A (9.5)***	***A (7.3)***	***B (11.4)***
9. Potomac Avenue & East Custis Avenue	***A (5.9)***	***A (4.2)***	***A (5.9)***	***A (4.4)***	***A (6.0)***	***A (4.6)***
10. Potomac Avenue & East Howell Avenue	***A (2.6)***	***A (2.5)***	***A (2.7)***	***A (2.4)***	***A (2.8)***	***A (2.3)***
11. Commonwealth Avenue & West Glebe Road/East Glebe Road	***B (16.9)***	***B (15.6)***	***B (17.2)***	***B (16.4)***	***B (18.2)***	***B (17.9)***
12. Mt. Vernon Avenue & East Custis Avenue *(Unsignalized)*	***B (11.1)***	***B (12.1)***	***B (11.6)***	***B (12.7)***	***B (12.3)***	***B (13.7)***
13. Commonwealth Avenue & Mt. Vernon Avenue & Hume Avenue	***D (36.8)***	***C (34.5)***	***D (36.8)***	***C (34.5)***	***D (36.8)***	***C (34.5)***

Multimodal Mitigations and Transportation Improvement Recommendations – Proposed mitigation at the study intersections include:

Year 2018 Mitigation

- Improvement in north-south vehicle progression between traffic signals by adjusting traffic signal offsets.
- Modification of traffic signal phasing at the intersection of US Route 1 and East Reed Avenue.
  - Eastbound and westbound signal phasing is modified from split phase to concurrent phasing with protected-permitted left turn phases.
  - Northbound right turn phase is modified to allow overlap right turns
- Modification of traffic signal phasing at the intersection of US Route 1 and East Glebe Road.
  - Eastbound right turn movement is modified to allow overlap right turns.
- Modification of lane configurations at the intersection of US Route 1 and Swann Avenue.
  - Eastbound and westbound lanes modified from shared thru-left lanes and exclusive right lanes to exclusive left turn lanes and shared thru-right lanes.

Year 2021 Mitigation

- Increase in traffic signal cycle length along Route 1 from 140 seconds to 160 seconds
- Improvement in north-south vehicle progression between traffic signals by adjusting traffic signal offsets.
- Modification of traffic signal phasing and lane configurations at the intersection of US Route 1 and East Reed Avenue.
  - Eastbound and westbound signal phasing is modified from split phase to concurrent phasing with protected-permitted left turn phases.

  - Northbound right turn phase is modified to allow overlap right turns
  - Westbound lanes modified from exclusive left turn lane and shared thru-right lane to exclusive left, thru, and right lanes.
- Modification of traffic signal phasing and lane configurations at the intersection of US Route 1 and East Glebe Road.
  - Eastbound right turn movement is modified to allow overlap right turns.
  - Eastbound lanes modified from exclusive right turn lane and shared thru-left lane to exclusive left, thru, and right lanes. It is noted that ROW acquisition/widening may be required to accommodate the eastbound lane configuration change. This future lane configuration and associated ROW impacts were also identified in the Potomac Yard Multimodal Transportation Study as strategies to accommodate the future Potomac Yard-generated traffic.
  - Westbound lanes modified from exclusive right turn lane and shared thru-left lane to exclusive left turn lane and shared thru-right lane.
  - Eastbound and westbound left turn phasing modified to be protected-permitted movements.
- Modification of lane configurations at the intersection of US Route 1 and Swann Avenue.
  - Eastbound and westbound lanes modified from shared thru-left lanes and exclusive right lanes to exclusive left turn lanes and shared thru-right lanes.

Year 2027 Mitigation

- Increase in traffic signal cycle length along Route 1 from 140 seconds to 160 seconds
- Improvement in north-south vehicle progression between traffic signals by adjusting traffic signal offsets.
- Modification of traffic signal phasing and lane configurations at the intersection of US Route 1 and East Reed Avenue.
  - Eastbound and westbound signal phasing is modified from split phase to concurrent phasing with protected-permitted left turn phases.
  - Northbound right turn phase is modified to allow overlap right turns
  - Westbound lanes modified from exclusive left turn lane and shared thru-right lane to exclusive left, thru, and right lanes.
- Modification of traffic signal phasing and lane configurations at the intersection of US Route 1 and East Glebe Road.
  - Eastbound right turn movement is modified to allow overlap right turns.
  - Eastbound lanes modified from exclusive right turn lane and shared thru-left lane to exclusive left, thru, and right lanes. It is noted that ROW acquisition/widening may be required to accommodate the eastbound lane configuration change. This future lane configuration and associated ROW impacts were also identified in the Potomac Yard Multimodal Transportation Study as strategies to accommodate the future Potomac Yard-generated traffic.
  - Westbound lanes modified from exclusive right turn lane and shared thru-left lane to exclusive left turn lane and shared thru-right lane.

  - Eastbound and westbound left turn phasing modified to be protected-permitted movements.
- Modification of lane configurations at the intersection of US Route 1 and Swann Avenue.
  - Eastbound and westbound lanes modified from shared thru-left lanes and exclusive right lanes to exclusive left turn lanes and shared thru-right lanes.
- Modification of lane configurations at the intersection of US Route 1 and Custis Avenue.
  - Eastbound and westbound lanes modified from shared left, thru, right lanes to exclusive left turn lanes and shared thru-right lanes. It is noted that while ROW acquisition/widening may be required to accommodate the lane configuration change, this future lane configuration and associated ROW impacts were also identified in the Potomac Yard Multimodal Transportation Study as strategies to accommodate the future Potomac Yard-generated traffic.

The mitigations described above seek to minimize the impact of the Oakville Triangle development related traffic. The mitigation analysis is shown in Tables 1-4, 1-5, and 1-6.

Table 1-4: Mitigation Summary of 2018 Future With Development Traffic Analysis LOS (sec/veh)

Intersection	2018 Without Development		2018 With Development		2018 With Development and Mitigation	
	AM	PM	AM	PM	AM	PM
1. US Route 1 & East Reed Avenue	*D (50.5)*	*C (32.4)*	*D (54.4)*	*C (32.6)*	*C (32.7)*	*C (32.1)*
2. US Route 1 & East Glebe Road	*C (33.8)*	*B (16.8)*	*D (36.4)*	*B (18.0)*	*D (36.3)*	*B (16.8)*
3. US Route 1 & Swann Avenue	*A (6.9)*	*A (8.6)*	*A (9.7)*	*B (11.7)*	*A (7.9)*	*A (8.5)*

Table 1-5: Mitigation Summary of 2021 Future With Development Traffic Analysis LOS (sec/veh)

Intersection	2021 Without Development		2021 With Development		2021 With Development and Mitigation	
	AM	PM	AM	PM	AM	PM
1. US Route 1 & East Reed Avenue	*F (83.8)*	*D (42.2)*	*F (100.9)*	*D (50.8)*	*D (43.4)*	*C (34.4)*
2. US Route 1 & East Glebe Road	*E (69.1)*	*C (22.9)*	*F (83.4)*	*D (35.2)*	*E (70.3)*	*C (30.5)*
3. US Route 1 & Swann Avenue	*A (9.4)*	*B (13.3)*	*C (25.6)*	*C (29.4)*	*B (16.7)*	*B (17.5)*

Table 1-6: Mitigation Summary of 2027 Future With Development Traffic Analysis LOS (sec/veh)						
Intersection	2027 Without Development		2027 With Development		2027 With Development and Mitigation	
	AM	PM	AM	PM	AM	PM
1. US Route 1 & East Reed Avenue	***F (141.7)***	***E (74.9)***	***F (159.9)***	***F (89.4)***	***F (107.1)***	***E (55.9)***
2. US Route 1 & East Glebe Road	***F (125.7)***	***E (59.9)***	***F (148.6)***	***F (91.4)***	***F (118.1)***	***E (78.2)***
3. US Route 1 & Swann Avenue	***C (27.8)***	***B (19.4)***	***E (70.7)***	***D (54.4)***	***D (51.7)***	***C (24.3)***
4. US Route 1 & Custis Avenue	***D (44.5)***	***B (10.2)***	***E (62.7)***	***B (12.6)***	***C (22.9)***	***B (12.4)***

The analysis results indicate that in 2018 and 2021, the intersections can be improved to LOS of E or better using these mitigations, with LOS E representing an acceptable operation in most urban areas. The analysis results indicate that in 2027, while significant delay reductions can be realized, the total volume of traffic results in LOS F conditions at selected intersections along Route 1.

At Reed, Glebe, and Custis, the proposed 2027 conditions with mitigation strategies in place result in overall intersection LOS that is equivalent or better that the LOS of the 2027 conditions without development. While the LOS of the Swann Avenue intersection does not return to the without development condition, it represents a significant improvement compared to the 2027 condition with development and without mitigation and will operate at LOS D and C in the AM and PM peak hours respecticely.

As no further widening of US 1 Route 1 is planned, in order for it to have continued success as a viable north-south alternative to the I-95 corridor, traffic patterns in the Route 1 Corridor may need to change. This may be achieved naturally, as local and regional travelers make better use of the interconnected network of streets and as traffic adjusts to other north-south roads (Potomac Avenue and Main Line Boulevard). This may also be achieved by progressive emphasis on transit and other alternate modes of travel that further reduce the auto dependency of the Route 1 Corridor.

Minor traffic impacts are anticipated at other study area intersections, but these intersections will continue to operate at LOS D or better. Recognizing the interconnected nature of the study area streets, operations at the intersection are likely to be better than the calculated figures because the traffic will balance among the many intersections along US 1. Further, the global mitigation strategies suggested in this report (improving traffic signal progression and increasing traffic signal cycle length) may serve to improve the north-south throughput of all Route 1 intersections.