



WELLS + ASSOCIATES

# BREEZEWAY PROPERTY TRAFFIC IMPACT STUDY

CITY OF FAIRFAX, VIRGINIA

Revised through: October 1, 2021



# **BREEZEWAY PROPERTY**

## Transportation Impact Study

**Revised through: October 1, 2021**

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TRAFFIC IMPACT STUDY  
CITY OF FAIRFAX, VIRGINIA**

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**SECTION 1  
INTRODUCTION**

This report presents the results of a revised traffic impact study conducted in support of the proposed redevelopment of a site in the City of Fairfax currently developed with the 50-room Breezeway Motel, the 38-unit Fairfax Garden Apartments, and four (4) single family homes and presents an evaluation of the existing and future transportation network.

This study was conducted in accordance with a scoping agreement developed with City of Fairfax staff. The study scope was determined with City staff based on a review of key study intersections and roadways that would potentially be affected by the implementation of the proposed redevelopment and the number of new trips expected to be generated. In addition, this study includes analyses of future conditions with the redevelopment of the adjacent American Legion (Toll Brothers) property on the east side of Oak Street (current redevelopment application not yet approved) for informational purposes.

The subject site is located south of Fairfax Boulevard, east of Walnut Street and west of Oak Street, in the City of Fairfax, Virginia, as shown on Figure 1-1.

The site consists of six (6) land parcels within the City of Fairfax. These parcels include:

<u>Property ID</u>	<u>Address</u>	<u>Acreage</u>
57-1-14-043	10829 Fairfax Blvd.	1.15 acres
57-1-14-055A	10807 - 10818 Cedar Ave	2.08 acres
57-1-14-083	3937 Walnut Street	0.56 acres
57-1-14-075A	3934 Oak Street	0.34 acres
57-1-14-076A	3932 Oak Street	0.25 acres
57-1-14-077A	3930 Oak Street	<u>0.25 acres</u>
	Total	4.63 acres

The applicant, Pulte Home Company, LLC. plans to develop 62 residential townhomes and up to 10,010 SF of commercial space. The site plan is shown on Figure 1-2.

According to the 24VAC30-155 (“Chapter 870”) regulations, all development proposals which meet certain specific trip generation thresholds are subject to the regulations as outlined in the Virginia Department of Transportation’s (VDOT) Traffic Impact Analysis Regulations Administrative Guidelines (“Administrative Guidelines”). In January 2012, an amendment to the Administrative Guidelines took effect, which determined a development proposal is considered to substantially impact the transportation network if it generates 5,000 or more net new daily vehicle trips located on, or within 3,000 feet of, a VDOT maintained roadway. Based on the trips anticipated to be generated by the subject development, the development would not require a VDOT Chapter 870 compliant traffic study.

Although a traffic impact analysis is not required per 24VAC30-155, the City of Fairfax has requested the submission of a traffic study in conjunction with this development application.

This traffic study was completed in accordance with the City of Fairfax policies and guidelines and is intended to address the following issues:

1. Estimation of the net new vehicle trip ends generated by the planned land uses during the AM and PM commuter peak hours and during the PM school peak hour.
2. Determination of the effects of the proposed development on the surrounding local roadway network.
3. Identification of potential road and/or operational improvements necessary to accommodate the project.

Based on the traffic study scoping form provided in Appendix A, tasks undertaken to prepare this study included the following:

1. Reviewed the applicant's conceptual plans for the subject site.
2. Field reviewed the subject site in order to determine existing roadway and intersection geometrics and traffic controls, access opportunities and/or constraints, and general traffic conditions.
3. Conducted peak hour turning movement counts obtained at the following study intersections:
  - Fairfax Boulevard/Fairchester Drive, Walnut Street
  - Fairfax Boulevard/Meredith Drive/Oak Street
  - Walnut Street/Cedar Avenue
  - Oak Street/Cedar Avenue
  - Walnut Street/2<sup>nd</sup> Street
  - Oak Street/2<sup>nd</sup> Street
4. Calculated existing AM and PM commuter peak hour intersection levels of service at the study intersections.
5. Identified the number of net new peak hour trips that would be generated by the proposed mixed-use development less trips currently generated by the existing land uses based on standard Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition equations and weighted average rates.
6. Determined future background traffic forecasts based on regional traffic growth and estimates of traffic that would be generated by other approved/planned developments in the site vicinity.
7. Calculated future levels of service with and without the proposed development at the key study intersections for a proposed build-out year of 2024.



Sources of data for this analysis include traffic counts conducted by Wells + Associates Inc., information obtained from the City of Fairfax, the Institute of Transportation Engineers (ITE), VDOT, the Highway Capacity Manual 2000 (Synchro software, version 10), Pulte Home Company, LLC., and the files and library of Wells + Associates.

## Conclusions

Based on the results of this traffic impact study, the following may be concluded:

1. The Fairfax Boulevard/Oak Street – Meredith Drive and Fairfax Boulevard/Walnut Street – Fairchester Drive signalized intersections currently operate at an overall LOS “C” or better during the AM and PM commuter peak periods based on Highway Capacity Manual calculations using the Synchro 10 traffic analysis software. Side street approaches at these intersections currently operate at LOS “E” or “F” during the peak periods due to long cycle lengths and the assignment of most of the green time to the Fairfax Boulevard approaches.
2. Historic VDOT traffic data indicates that average daily traffic counts along Fairfax Boulevard have increased by approximately 0.55% per year between 2013 and 2018.
3. The Novus Fairfax Gateway (Fairfield at Gateway - The Moxley) and Paul VI Redevelopment approved pipeline developments are anticipated to generate 543 AM commuter peak hour trips and 912 PM commuter peak hour trips at full buildout.
4. Under future 2024 traffic conditions, minimal increases in delay at the study intersections are expected due to the trips generated by approved pipeline developments in the vicinity of the site and overall levels of service would remain generally consistent with existing conditions.
5. The site is currently developed with the 50-room Breezeway Motel, the 38-unit Fairfax Garden Apartments, and four (4) single family homes.
6. The Applicant proposes to redevelop the site with 62 residential townhouse units and up to 10,010 SF of commercial uses.
7. The project is estimated to generate 40 AM peak commuter hour trips and 140 PM peak commuter hour trips upon buildout.
8. Under future 2024 traffic conditions, with the development of the subject site, intersection levels of service would remain generally consistent with existing and background conditions. The analyses show that the Fairfax Boulevard signalized intersections will continue to operate at LOS “C” or better during the AM and PM commuter peak periods.

9. All unsignalized intersection and access drive approaches will operate at LOS “B” or better during each of the studied peak periods.
10. Access to the commercial portion of the site will be via one full access driveway along Fairfax Boulevard and one right-in/right-out/left-out driveway on Walnut Street. Access to the northern residential portion of the site will be provided via one full access driveway along Walnut Street. Access to the southern residential portion of the site will be provided via one full access driveway along Oak Street.
11. The Applicant intends to improve the roadway geometrics at the Walnut Street/Cedar Avenue intersection by reconstructing the intersection as a four-leg, stop controlled intersection in order to enhance vehicular, pedestrian and bicycle safety.
12. Access to the existing Breezeway Motel is currently provided at two locations along Fairfax Boulevard. The Applicant intends to consolidate these access drives to a single location providing enhanced access management along this arterial roadway.
13. An updated alternative analysis has been added in this revision of the study to include the added impact of the potential redevelopment of the American Legion (Toll Brothers) site on the east side of Oak Street per the latest available development proposal for that site. Since the application for that redevelopment is not currently approved, this additional assessment is provided for informational purposes. Further, as requested by Staff, the Applicant has coordinated with the developer of that site to better align the Oak Street site driveway with their relocated driveway. Also included in this alternative assessment are potential future improvements (by others) along Walnut Street to include a bike lane along the northbound travelway. The results of these alternative analyses indicate that both background and total future conditions would be generally consistent with those presented in this study that do not include the American Legion (Toll Brothers) redevelopment or the Walnut Street bike lane improvements. This is primarily due to the relatively low increase in site traffic that would result from that redevelopment and the excess capacity along Oak Street that can adequately accommodate the additional traffic. Additional details regarding this additional alternative analysis are presented in Appendix F.

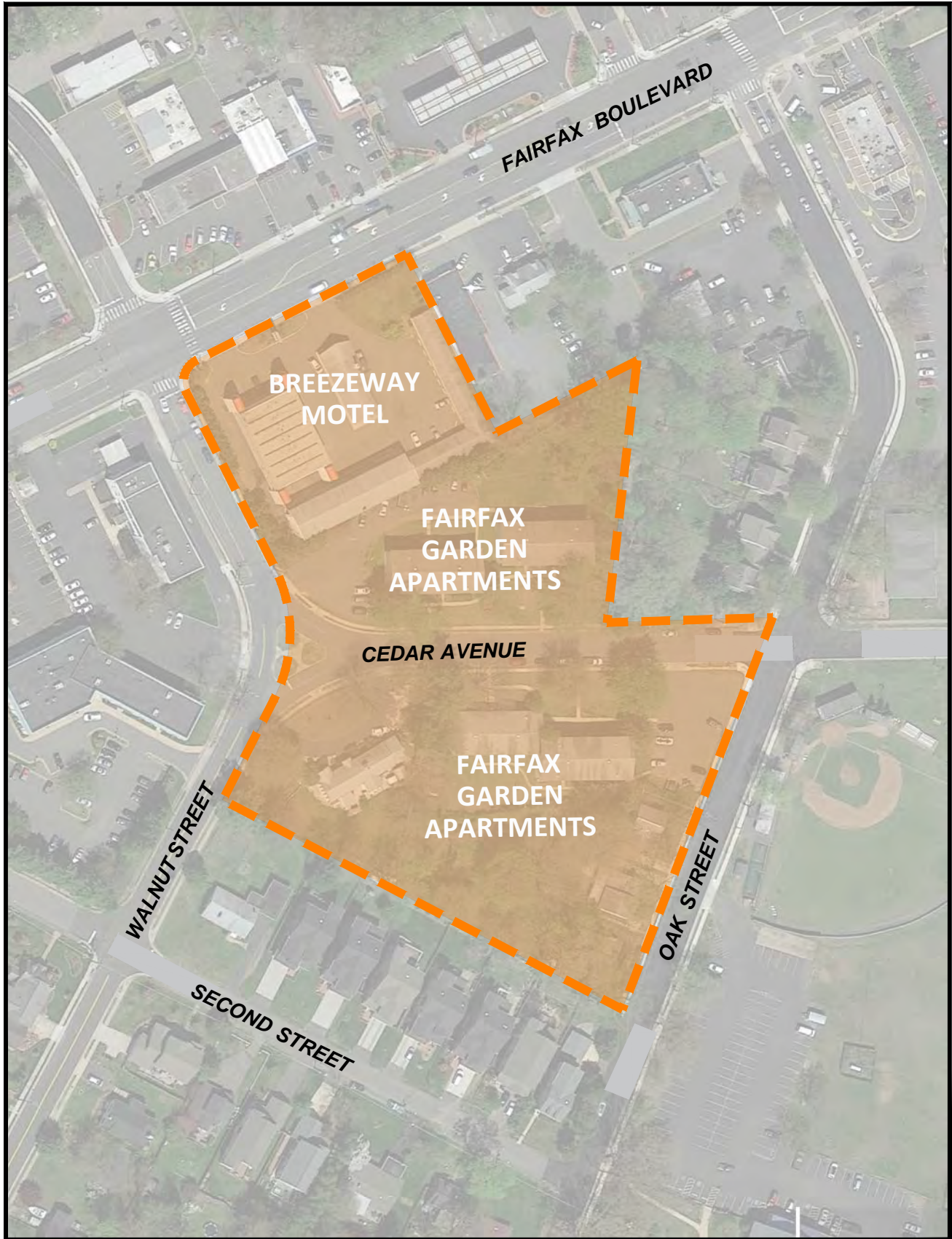
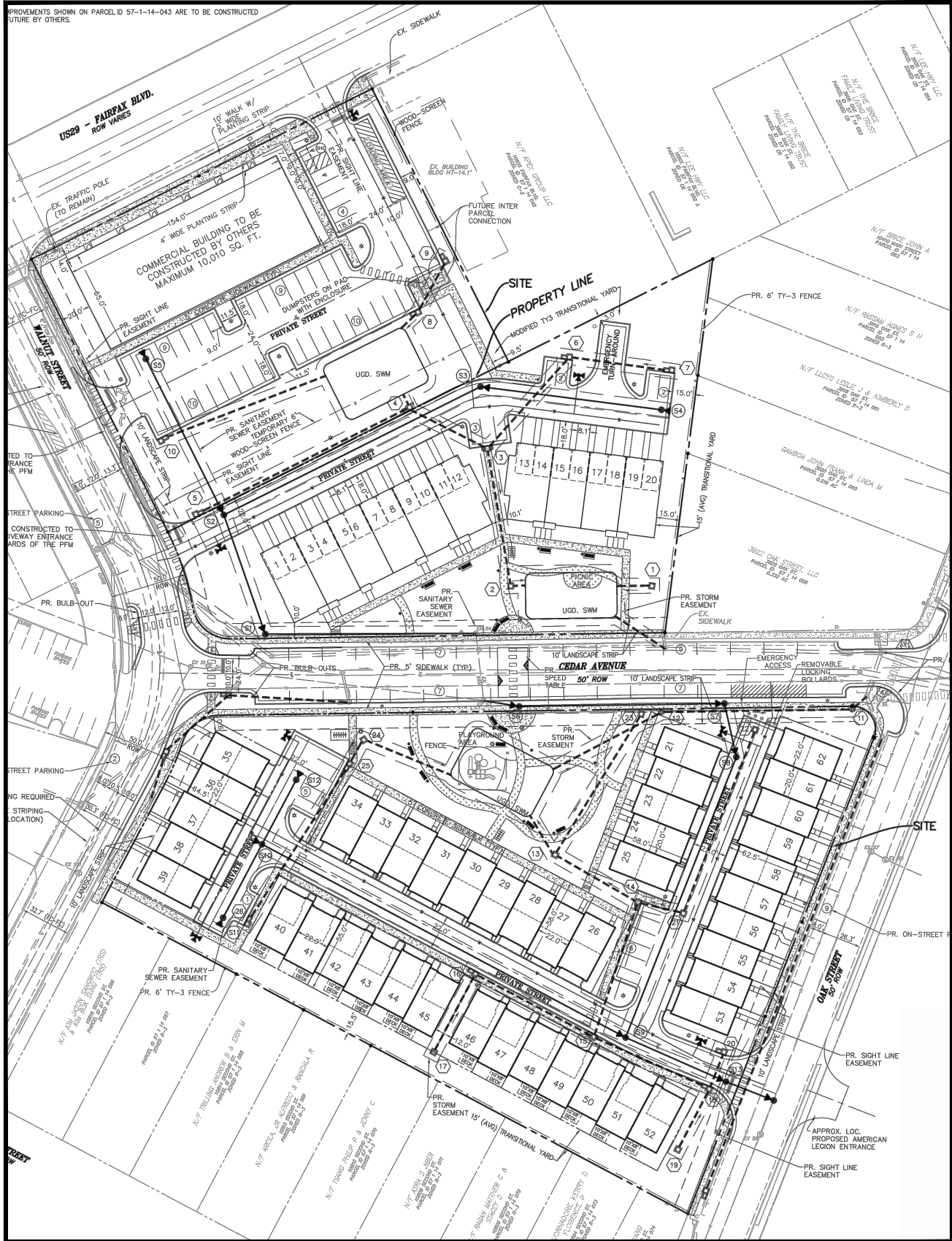


Figure 1-1  
Site Location



NORTH

Breezeway Property  
City of Fairfax, Virginia



PLAN PROVIDED BY: ATCS, P.L.C.

Figure 1-2  
Concept Plan



NORTH  
Breezeway Property  
City of Fairfax, Virginia



## SECTION 2 BACKGROUND INFORMATION

### Location and Surrounding Uses

As shown in Figure 1-1, the site is regionally located approximately 1/3 mile east of Main Street on Fairfax Boulevard in the City of Fairfax. Regional Access is provided by I-66 via Lee Jackson Memorial Highway/Main Street and Chain Bridge Road. Fairfax Boulevard/Arlington Boulevard provides access to/from I-495 (the Capital Beltway).

Properties immediately south of the site are generally residential in nature while commercial uses are predominantly along Fairfax Boulevard.

### Comprehensive Plan Land Use Recommendations

The City's Comprehensive Plan shows the subject parcels as Commercial Corridor and Multifamily Neighborhood on the Future Land Use Map.

### Existing Transportation Network

**Existing Road Network.** The following are descriptions of the roadways in the vicinity of the proposed development.

Fairfax Boulevard is classified as an arterial roadway according to the City of Fairfax Comprehensive Plan. Within the vicinity of the subject site, Fairfax Boulevard is constructed as a five-lane, undivided roadway with a center two-way left turn lane and a posted speed limit of 35 miles per hour. Traffic signals are provided at major cross-streets including Main Street, Fairchester Drive/Walnut Street, and Meredith Drive/Oak Street. Based on 2018 VDOT average annual daily traffic (AADT) data, Fairfax Boulevard east of Main Street carries approximately 37,000 vehicles per day (vpd). This roadway currently provides access to the Breezeway Motel via two driveways.

Main Street is also classified by the Comprehensive Plan as an arterial roadway and is constructed as a four-lane, median-divided roadway with a posted speed limit of 35 miles per hour. Based on 2018 VDOT AADT data, Main Street east of the Kamp Washington intersection carries approximately 38,000 vpd.

Walnut Street is a two-lane north-south undivided roadway with a width of approximately 33 feet. Walnut Street currently provides access to residential and commercial properties south of Fairfax Boulevard and will provide access to the proposed development.

Cedar Avenue is a two-lane east-west discontinuous roadway. The section of Cedar Avenue west of Oak Street is approximately 30 feet in width. Cedar Avenue currently provides access to the Fairfax Garden Apartments but will not provide direct access to general site traffic for the proposed development.

Oak Street is a two-lane north-south undivided roadway with a width of approximately 33 feet. Oak Street provides access to residential and commercial properties south of Fairfax Boulevard and to Paul VI Catholic High School via Cedar Avenue. Oak Street will provide access to the proposed development.

Second Street is a two-lane east-west undivided roadway with a width of between 24 and 36 feet. Second Street is approximately two (2) blocks in length and connects Fairfax Boulevard to the west with Oak Street to the east.

Existing lane use and traffic control at each of the study intersections is shown on Figure 2-1.

**Public Transit Service.** The site is served by the City of Fairfax’s City-University Energysaver (CUE) Bus “Gold Route” along Main Street and Warwick Avenue. This service provides access between the George Mason University (GMU) campus and the Vienna/Fairfax-GMU metrorail station, via University Drive, Chain Bridge Road, West Street, Main Street, Lee Highway, Jermantown Road, Orchard Street, Bevan Drive, Warwick Avenue and Fairfax Boulevard. Additionally, the site is served by the “Green Route” which provides service between the GMU campus, Old Town Fairfax, and the Vienna/Fairfax-GMU metrorail station via University Drive, Chain Bridge Road, Eaton Place, Fairfax Boulevard, Fairfax Circle, Arlington Boulevard, Nutley Street, Virginia Center Boulevard, Old Pickett Road, Pickett Road, Main Street, North Street, and George Mason Boulevard.

**Pedestrian Facilities.** Concrete sidewalks are provided along both sides of Fairfax Boulevard Walnut Street, Oak Street, and Cedar Avenue site frontages. Marked crosswalks are provided across the north, south, and east legs of the Fairfax Boulevard/Meredith Drive/Oak Street and the Fairfax Boulevard/Walnut Street/Fairchester Drive signalized intersections; and across all legs of the Cedar Avenue/Oak Street/Panther Place unsignalized intersection. A mid-block crosswalk is provided along Oak Street between Cedar Avenue and Second Street.

### **Future Transportation Network**

The City of Fairfax’s Comprehensive Plan provides recommended strategies for the improvement of the City’s transportation network. In general, the Plan recommends that the City should strive to achieve a balance between allowing for the efficient movement of traffic and providing safe and convenient access to City businesses and residences for vehicles, pedestrians, bicycles, and other modes of transport. In terms of roadway operational improvements, the Plan recommends that through traffic should be encouraged to utilize the City’s arterial system (cf. Comprehensive Plan, Strategy T-7.4.1). Therefore, no specific capacity improvements (i.e., roadway widening) are recommended for the collector streets that immediately surround the subject site. Any improvements to these streets should focus on enhancing safety and the mobility of pedestrians, bicycles, and public transit.

The design of the existing Walnut Street/Cedar Avenue intersection is not conventional. The Walnut Street and Cedar Avenue approaches are separated by a triangular median island. Two-way traffic is permitted along each side of the median island that results in multiple conflict points and is potentially confusing to drivers as to who has right-of-way when traversing the intersection. The Applicant intends to improve this situation by reconstructing the intersection as a traditional four-leg, stop controlled intersection. This redesign will enhance vehicular, pedestrian and bicycle safety.

Additional potential improvements along Walnut Street are considered in the alternative future analysis that also includes the redevelopment of the American Legion/Toll Brothers site. As discussed with Staff, these improvements may include the inclusion of a bike lane along the northbound travelway of Walnut Street and the reduction of Walnut Street from two northbound lanes to a single northbound lane between Cedar Avenue and Fairfax Avenue.

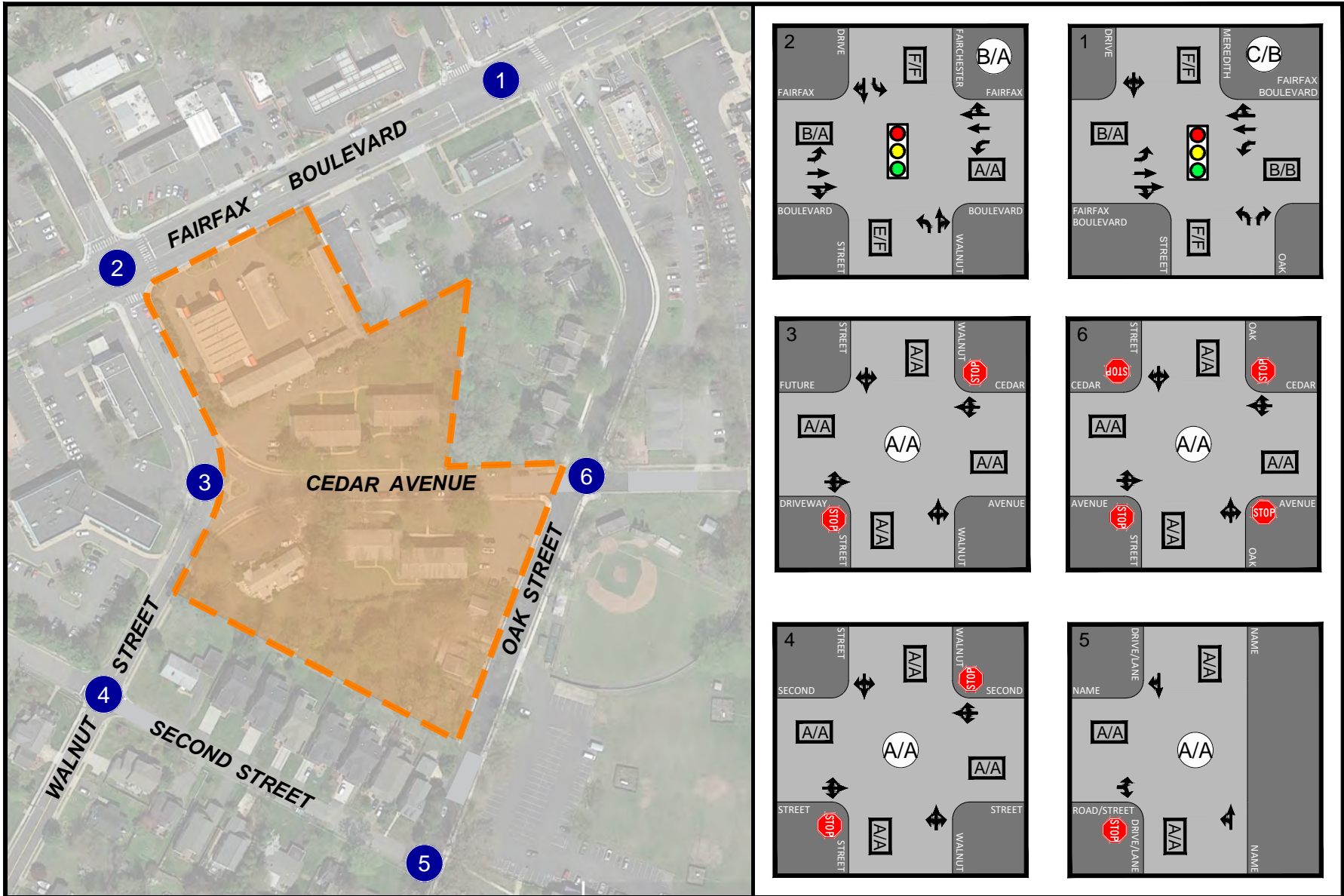


Figure 2-1  
Existing Lane Use, Traffic Control and Levels of Service

- Study Intersection
- Approach LOS - AM/PM
- Intersection LOS - AM/PM
- Represents One Travel Lane
- Signalized Intersection
- Stop Sign



NORTH

Pulte Group, Inc.  
City of Fairfax, Virginia





## SECTION 3 STUDY SCOPE AND ANALYSIS PARAMETERS

### Overview

The subject site is located south of Fairfax Boulevard, east of Walnut Street, and west of Oak Street in the City of Fairfax, Virginia. The subject property is comprised of five parcels totaling 4.63 acres north and south of Cedar Avenue. The parcel developed with the existing Breezeway Motel is zoned DR (Commercial Retail) and the parcels developed with existing residential uses are zoned RMF (Residential Multifamily) and RH (Residential High).

The primary objective of this study is to assess the impacts of the proposed development plan on the surrounding street system.

This traffic study was conducted in accordance with the scoping document and discussions with Wells + Associates, City staff, and the Applicant and has been subsequently revised based on plan revisions and discussions with City Staff. A traffic study scoping meeting was held on June 25, 2019, and resulted in a scoping form dated July 3, 2019 that is provided in Appendix A. As previously noted, the revised development plan includes up to 10,010 SF of commercial space and 62 dwelling units. Additionally, site access has been updated per the current development plan.

### Study Area

The study area was determined based on the intersections and roadways that potentially would be affected by implementation of the proposed development plan. The following intersections were selected for analysis and evaluation:

- Fairfax Boulevard/Meredith Drive/Oak Street
- Fairfax Boulevard/Fairchester Drive, Walnut Street
- Walnut Street/Cedar Avenue
- Walnut Street/Second Street
- Oak Street/Second Street
- Oak Street/Cedar Avenue-Panther Place
- All Site Access Drives

### Site Development Program

The Applicant is proposing to redevelop the property with 62 residential units to include townhomes and stacked condos. A commercial building with up to 10,010 SF of space is proposed along Fairfax Boulevard.

### Analysis Study Periods

The intersections within the study area were analyzed under AM and PM commuter peak hour conditions.

### Existing Traffic Volumes

Existing AM and PM commuter peak hour turning movements and pedestrian counts were conducted on Thursday, July 11, 2019, at the study intersections from 6:00 AM to 9:00 AM and from 4:00 PM to 7:00 PM. These counts were compared to counts at the Fairfax Boulevard study intersection conducted when school was in session on Wednesday, February 3, 2016 and Thursday, March 1, 2018 after deducting traffic generated by the soon to be closed Paul VI Catholic High School. This comparison indicates that the current (July 11, 2019) counts were between 7% and 23% higher than counts collected during the school year (adjusted to reflect the closure of Paul VI) during the AM peak hour and between 3% and 6% higher than counts collected during the school year (adjusted to reflect the closure of Paul VI) during the PM peak hour.

Based on this comparison, the higher current (July 11, 2019) counts were utilized in this traffic analysis. Additionally, counts along Fairfax Boulevard were balanced between the Walnut Street/Fairchester Drive and Oak Street/Meredith Drive intersections in both directions by choosing the higher of the entering and exiting volumes at each intersection.

The existing vehicular traffic volumes balanced as described above are provided on Figure 3-1. All existing count data is included in Appendix B.



Figure 3-1  
Existing Peak Hour Traffic Volumes

AM PEAK HOUR  
PM PEAK HOUR  
000 / 000



NORTH

Pulte Group, Inc.  
City of Fairfax, Virginia

## SECTION 4 EXISTING CONDITIONS ANALYSIS

### Existing Intersection Levels of Service

Peak hour levels of service were calculated for the study intersections based on the existing lane use and traffic controls shown on Figure 2-1, the existing traffic volumes shown on Figure 3-1, and the 2000 Highway Capacity Manual (HCM) analysis procedures for signalized and unsignalized intersections. The results are presented in Appendix C and summarized on Table 4-1.

The analyses show that the signalized intersections along Fairfax Boulevard currently operate at level of service "C" (LOS "C") or better during the AM and PM peak commuter periods. The side street approaches to the signalized intersections operate at LOS "E" and "F" with average delays between 75 seconds and 110 seconds. However, the volume-to-capacity (v/c) ratios for the side street approaches at intersections along Fairfax Boulevard are well below 1.0, indicating that the lengthy delays are the result of long cycle lengths (190 seconds during the AM commuter peak hour and 220 seconds during the PM commuter peak hours) and the assignment of the predominance of the green time to the Fairfax Boulevard approaches, rather than insufficient capacity.

All approaches at the unsignalized intersections of Walnut Street/Cedar Avenue, Walnut Street/Second Street, Oak Street/Second Street, and Oak Street/Cedar Avenue – Panther Place operate at LOS "A" during each of the peak periods.

**Table 4-1**  
**Breezeway Property**  
 Existing Intersection Capacity Analysis Summary

Intersection	Intersection Control	Approach	Existing	
			AM Peak	PM Peak
1. Fairfax Boulevard & Meredith Drive/Oak Street	Signal	EB Appr	B (17.8)	A (8.8)
		WB Appr	B (14.9)	B (17.3)
		NB Appr	F (87.1)	F (100.2)
		SB Appr	F (88.4)	F (102.4)
		<b>Overall</b>	<b>C (21.2)</b>	<b>B (18.7)</b>
2. Fairfax Boulevard & Fairchester Drive/Walnut Street	Signal	EB Appr	B (13.0)	A (8.0)
		WB Appr	A (3.0)	A (1.7)
		NB Appr	E (76.5)	F (90.3)
		SB Appr	F (92.7)	F (105.7)
		<b>Overall</b>	<b>B (14.6)</b>	<b>A (9.4)</b>
3. Walnut Street/Cedar Avenue	Stop	EB Appr	A (0.0)	A (9.4)
		WB Appr	A (9.4)	A (9.6)
		NB Appr	A (0.4)	A (0.1)
		SB Appr	A (3.2)	A (1.5)
		<b>Overall</b>	<b>A (2.4)</b>	<b>A (2.5)</b>
4. Walnut Street/Second Street	Stop	EB Appr	A (7.5)	A (7.3)
		WB Appr	A (7.2)	A (7.3)
		NB Appr	A (7.8)	A (7.5)
		SB Appr	A (7.5)	A (7.7)
		<b>Overall</b>	<b>A (7.7)</b>	<b>A (7.6)</b>
5. Oak Street/Second Street	Stop	EB Appr	A (7.0)	A (7.1)
		NB Appr	A (7.7)	A (7.7)
		SB Appr	A (7.8)	A (7.7)
		<b>Overall</b>	<b>A (7.7)</b>	<b>A (7.7)</b>
6. Oak Street/Cedar Avenue/Panther Place	Stop	EB Appr	A (8.1)	A (7.6)
		WB Appr	A (8.0)	A (7.5)
		NB Appr	A (8.1)	A (7.9)
		SB Appr	A (8.4)	A (7.9)
		<b>Overall</b>	<b>A (8.2)</b>	<b>A (7.8)</b>

## SECTION 5 ANALYSIS OF FUTURE CONDITIONS WITHOUT SITE DEVELOPMENT

### Overview

Forecasts for traffic conditions without the redevelopment of the Breezeway Property were estimated at the study intersections based on a composite of existing traffic regional traffic growth, and pipeline development trips as described below. Future levels of service under these forecasted conditions were evaluated at the study intersections.

### Regional Traffic Growth

A review of VDOT AADT volumes along Fairfax Boulevard and Main Street in the vicinity of the site indicates modest growth in traffic volumes over the past five (5) years. AADT volumes along Fairfax Boulevard east of Main Street rose from 36,000 vehicles in 2013 to 37,000 vehicles in 2018, an average annual increase of approximately 0.55% per year.

Based on these findings, existing traffic volumes were increased by 0.55% per year to the anticipated build-out of the site in 2024.

### Traffic from Other Approved/Pending Developments

At the request of City staff, the following approved/pending developments were included as approved (i.e., “pipeline”) developments:

- Novus Fairfax Gateway
  - 4,000 SF Office
  - 5,000 SF Quality Restaurant
  - 7,400 SF High Turn-Over Sit-Down Restaurant
  - 12,600 SF Shopping Center
  - 395 Residential Apartments
  
- Paul VI Redevelopment
  - 259 Residential Condominiums/Townhouses
  - 7 Single Family Dwelling Units
  - 24,000 SF of Community Space
  - 20,000 SF of Retail Space

As shown in Table 5-1, these pipeline developments are anticipated to generate 543 AM peak commuter hour trips and 912 PM commuter peak hour trips at full buildout. It is noted that not all of these trips will utilize the study intersections along Fairfax Boulevard, Walnut Street and Oak Street.

An additional alternative background conditions analysis is included in Appendix F that includes the potential redevelopment of the American Legion (Toll Brothers) site located on the east side of Oak Street. Since that development application is not currently approved, this additional analysis is provided for informational purposes only.

**Table 5-1  
Breezeway Property - City of Fairfax  
Background Development Trip Generation**

Use	ITE Land Use Code	Amount	Units	AM Peak Hour			PM Peak Hour			ADT
				In	Out	Total	In	Out	Total	
<b>Novus Fairfax Gateway</b>										
Office	710	4,000	SF	5	1	6	1	5	6	44
Quality Restaurant	931	5,000	SF	2	2	4	25	12	37	450
High Turnover Restaurant	932	7,400	SF	44	36	80	44	29	73	941
Shopping Center	820	12,600	SF	27	17	44	72	78	150	1,767
Apartments	220	395	DU	<u>39</u>	<u>158</u>	<u>197</u>	<u>153</u>	<u>82</u>	<u>235</u>	<u>2,517</u>
<b>Total Novus Fairfax Gateway Trips</b>	--			<b>117</b>	<b>214</b>	<b>331</b>	<b>295</b>	<b>206</b>	<b>501</b>	<b>5,719</b>
<b>Paul VI - Redevelopment</b>										
Condominiums	232	144	DU	13	58	71	40	24	64	767
Single Family Homes	210	7	DU	4	11	15	6	4	10	91
Townhomes	230	115	DU	<u>10</u>	<u>48</u>	<u>58</u>	<u>45</u>	<u>22</u>	<u>67</u>	<u>726</u>
Subtotal Residential		266	DU	27	117	144	91	50	141	1,584
Community Space	495	24,000	SF	32	17	49	32	34	66	812
Local Serving Retail	820	20,000	SF	<u>12</u>	<u>7</u>	<u>19</u>	<u>98</u>	<u>106</u>	<u>204</u>	<u>2,386</u>
Subtotal Commercial		44,000	SF	44	24	68	130	140	270	3,198
<b>Total Paul VI Redevelopment</b>				<b>71</b>	<b>141</b>	<b>212</b>	<b>221</b>	<b>190</b>	<b>411</b>	<b>4,782</b>
<b>TOTAL BACKGROUND DEVELOPMENT TRIP GENERATION</b>				<b>188</b>	<b>355</b>	<b>543</b>	<b>516</b>	<b>396</b>	<b>912</b>	<b>10,501</b>

Notes: (1) Based on Trip Generation from Development Traffic Impact Studies

### Background Traffic Forecasts

The existing traffic volumes depicted on Figure 3-1, regional traffic growth, and the pipeline trip assignments shown on Figure 5-1 were added together to yield the background future traffic forecasts at the study intersections, shown on Figure 5-2.

### Background Future Levels of Service

Peak hour levels of service were calculated for the study intersections based on the existing lane use and traffic controls, background future traffic forecasts, and the 2000 Highway Capacity Manual (HCM) analysis procedures for signalized and unsignalized intersections. The results are provided in Appendix D, shown on Figure 5-3, and summarized in Table 5-2.

The analyses show that the signalized intersections along Fairfax Boulevard will continue to operate at level of service “C” (LOS “C”) or better during the AM and PM peak commuter periods. The side street approaches to the signalized intersections will continue to operate at LOS “E” and “F” with average delays between 75 seconds and 105 seconds. However, the volume-to-capacity (v/c) ratios for the side street approaches at intersections along Fairfax Boulevard will be well below 1.0, indicating that the lengthy delays will be the result of long cycle lengths (190 seconds during the AM commuter peak hour and 220 seconds during the PM commuter peak hours) and the assignment of the predominance of the green time to the Fairfax Boulevard approaches, rather than insufficient capacity.

All approaches at the unsignalized intersections of Walnut Street/Cedar Avenue, Walnut Street/Second Street, Oak Street/Second Street, and Oak Street/Cedar Avenue – Panther Place will operate at LOS “B” or better during each of the peak periods.

As previously noted, an additional alternative analysis is included in Appendix F that also includes the potential redevelopment of the (not currently approved) American Legion (Toll Brothers) redevelopment on the east side of Oak Street. The results of this additional analysis is generally consistent with the results summarized in Table 5-2 below with additional delays of less than 2 seconds/vehicle for any intersection approach included in the study.

**Table 5-2**

Breezeway Property

Background Future Intersection Capacity Analysis Summary

Intersection	Intersection Control	Approach	Existing		Background Future	
			AM Peak	PM Peak	AM Peak	PM Peak
1. Fairfax Boulevard & Meredith Drive/Oak Street	Signal	EB Appr	B (17.8)	A (8.8)	B (17.2)	A (8.1)
		WB Appr	B (14.9)	B (17.3)	B (13.8)	B (17.2)
		NB Appr	F (87.1)	F (100.2)	F (84.4)	F (100.3)
		SB Appr	F (88.4)	F (102.4)	F (88.3)	F (104.7)
		<b>Overall</b>	<b>C (21.2)</b>	<b>B (18.7)</b>	<b>C (20.3)</b>	<b>B (17.9)</b>
2. Fairfax Boulevard & Fairchester Drive/Walnut Street	Signal	EB Appr	B (13.0)	A (8.0)	B (12.8)	A (8.3)
		WB Appr	A (3.0)	A (1.7)	A (2.8)	A (1.7)
		NB Appr	E (76.5)	F (90.3)	E (76.6)	F (90.4)
		SB Appr	F (92.7)	F (105.7)	F (91.7)	F (103.9)
		<b>Overall</b>	<b>B (14.6)</b>	<b>A (9.4)</b>	<b>B (14.0)</b>	<b>A (8.9)</b>
3. Walnut Street/Cedar Avenue	Stop	EB Appr	A (0.0)	A (9.4)	B (10.7)	A (9.4)
		WB Appr	A (9.4)	A (9.6)	A (9.4)	A (9.5)
		NB Appr	A (0.4)	A (0.1)	A (0.4)	A (0.1)
		SB Appr	A (3.2)	A (1.5)	A (3.3)	A (1.7)
		<b>Overall</b>	<b>A (2.4)</b>	<b>A (2.5)</b>	<b>A (2.6)</b>	<b>A (2.5)</b>
4. Walnut Street/Second Street	Stop	EB Appr	A (7.5)	A (7.3)	A (7.4)	A (7.3)
		WB Appr	A (7.2)	A (7.3)	A (7.2)	A (7.3)
		NB Appr	A (7.8)	A (7.5)	A (7.8)	A (7.5)
		SB Appr	A (7.5)	A (7.7)	A (7.4)	A (7.6)
		<b>Overall</b>	<b>A (7.7)</b>	<b>A (7.6)</b>	<b>A (7.6)</b>	<b>A (7.5)</b>
5. Oak Street/Second Street	Stop	EB Appr	A (7.0)	A (7.1)	A (7.0)	A (7.1)
		NB Appr	A (7.7)	A (7.7)	A (7.8)	A (7.8)
		SB Appr	A (7.8)	A (7.7)	A (7.9)	A (7.8)
		<b>Overall</b>	<b>A (7.7)</b>	<b>A (7.7)</b>	<b>A (7.8)</b>	<b>A (7.8)</b>
6. Oak Street/Cedar Avenue/Panther Place	Stop	EB Appr	A (8.1)	A (7.6)	A (8.1)	A (7.6)
		WB Appr	A (8.0)	A (7.5)	A (8.3)	A (7.8)
		NB Appr	A (8.1)	A (7.9)	A (8.2)	A (8.0)
		SB Appr	A (8.4)	A (7.9)	A (8.5)	A (8.0)
		<b>Overall</b>	<b>A (8.2)</b>	<b>A (7.8)</b>	<b>A (8.3)</b>	<b>A (7.9)</b>







Figure 5-2  
2024 Background Future Peak Hour Traffic Forecasts  
With Pipeline Developments

AM PEAK HOUR  
PM PEAK HOUR  
000 / 000



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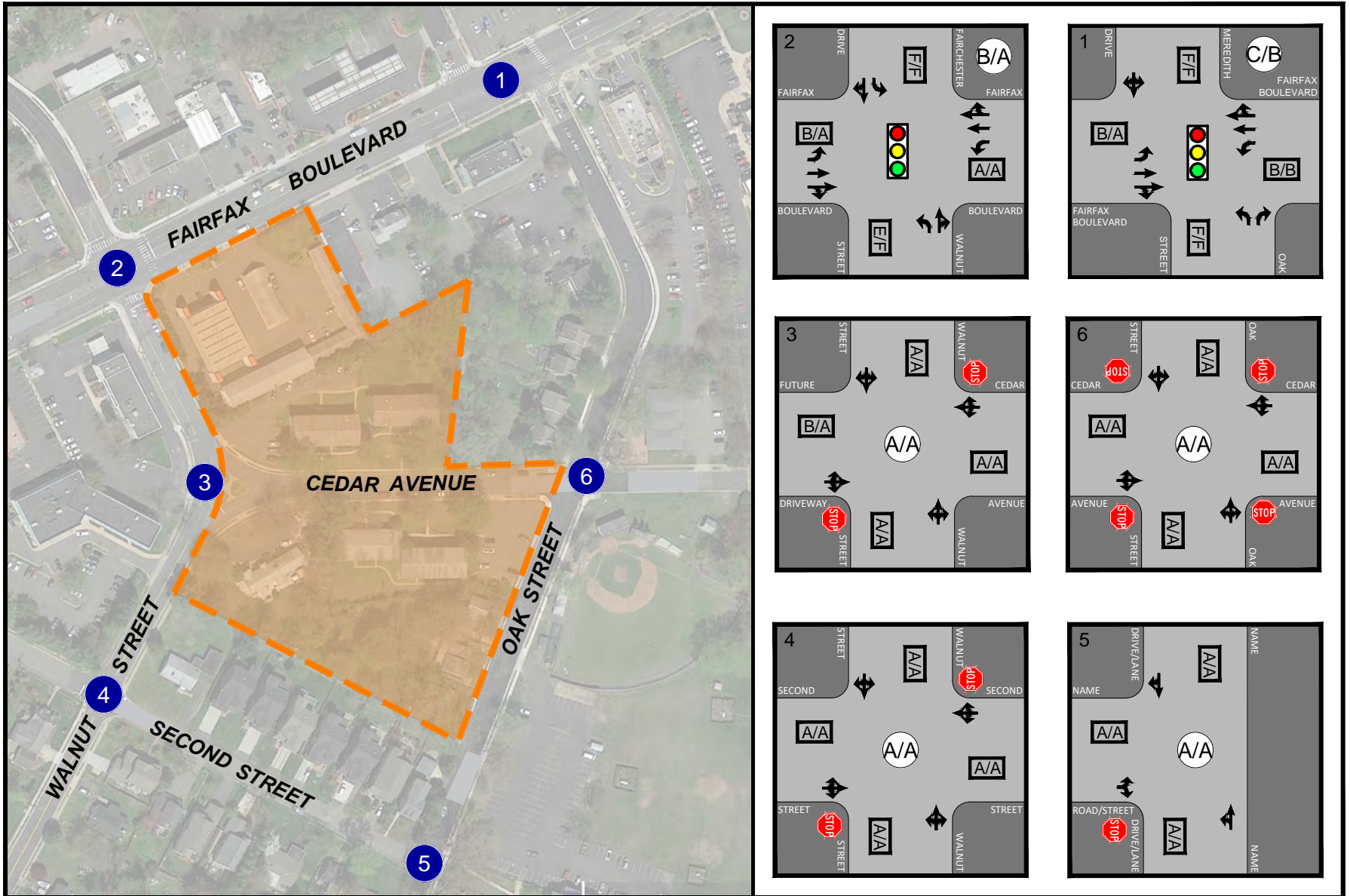


Figure 5-3  
2024 Background Lane Use, Traffic Control and Levels of Service

-  - Approach LOS - AM/PM
-  - Intersection LOS - AM/PM
-  Represents One Travel Lane
-  Signalized Intersection
-  Stop Sign



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## SECTION 6 SITE ANALYSIS

### Overview

Trips anticipated to be generated by the proposed development plan were forecasted and assigned to the surrounding roadway network. The generation, distribution, and assignment of site trips were based on the proposed redevelopment plan and program, as well as the locations of future site entrances in relation to the surrounding roadway network.

### Existing Site Trips

As stated previously, the site is currently developed with the 50-room Breezeway Motel, the 38-unit Fairfax Garden Apartments, and four (4) single family homes. The redevelopment plan calls for the elimination of these uses and the construction of 62 residential townhouse units and a commercial building with up to 10,010 SF of space. Additionally, while traffic counts were conducted during the summer, Paul VI Catholic School generated some traffic as exhibited by the traffic counts at the Oak Street/Cedar Avenue – Panther Place intersection. To provide a conservative analysis of future traffic conditions with the site, trips generated by the existing site uses and the activities at Paul VI Catholic School were not eliminated from the existing roadway network.

### Proposed Site Access

The site plan provided on Figure 1-2 shows that access to the northern commercial portion of the site is proposed at two locations, one full-movement driveway along Fairfax Boulevard approximately 250' east of Walnut Street – Fairchester Drive and a Right-In/Right-Out/Left-Out driveway along Walnut Street. Access to the northern residential portion of the site will be provided via a full-movement driveway on Walnut Street south of the commercial driveway. Access to the southern residential parcel will be provided along Oak Street approximately 300' south of Cedar Avenue – Panther Place.

### Trip Generation

**Overview.** Trip generation estimates for the AM and PM peak hours, as well as the average daily traffic, were derived from the standard Institute of Transportation Engineers (ITE) trip generation rates, as published in the Trip Generation Manual, 10<sup>th</sup> edition. The “Multi-family Housing – Low-rise” (220) land use code was used for the proposed townhomes units. For purposes of this assessment, the “Shopping Center” (820) land use code was used for the commercial component; however, it is noted that another commercial use other than general retail may ultimately fill all or a portion of the commercial space.

The trip generation analysis for the existing and proposed uses is presented in Table 6-1 and reflects a reduction in peak hour and daily trips from the previous study submission. When compared to the existing uses on site, the proposed development plan would result in an

overall increase of two (2) additional AM peak hour trips, an overall increase of approximately 109 additional trips during the PM peak hour and approximately 1,237 additional daily trips. For purposes of this study, existing trips were not removed from the road network, and the total 40 AM peak hour trips and 140 PM peak hour trips for the proposed uses were added to the road network.

**Table 6-1**  
**Breezeway Property**  
**ITE Trip Generation, 10th Edition**

Land Use	Ref	Size	Units	AM Peak Hour			PM Peak Hour			Daily Total
				In	Out	Total	In	Out	Total	
<b>Existing Site Uses</b>										
Motel	320	50	Rooms	8	13	21	11	10	21	152
Multifamily (Low Rise)	220	6	DU's	1	2	3	2	1	3	44
Multifamily (Mid-Rise)	221	32	DU's	3	8	11	9	6	15	173
Single-Family Detached	210	4	DU's	1	2	3	3	1	4	38
<b>Subtotal Existing Uses</b>				<b>13</b>	<b>25</b>	<b>38</b>	<b>25</b>	<b>18</b>	<b>43</b>	<b>407</b>
<b>Proposed Development Plan</b>										
Town Homes - North Land Bay	220	20	D.U.	2	8	10	9	5	14	110
Town Homes - South Land Bay	220	45	D.U.	5	17	22	18	11	29	299
Senior Adult Housing - Attached	252	32	DU	2	4	6	6	4	10	103
<b>Subtotal Proposed Uses</b>				<b>9</b>	<b>29</b>	<b>38</b>	<b>33</b>	<b>20</b>	<b>53</b>	<b>512</b>
<b>Net Difference: Approved vs. Proposed</b>				<b>-4</b>	<b>4</b>	<b>0</b>	<b>8</b>	<b>2</b>	<b>10</b>	<b>105</b>

It should be noted that no reduction in site generated trips due to transit mode split was taken in this analysis. However, it is anticipated that the project would take advantage of public transit opportunities available in the proximity of the site.

**Site Trip Distribution**

As agreed upon in the scope with City staff, site trip distribution used in the analysis was based on existing travel patterns and engineering judgment. For purposes of this analysis, the following distribution was used in the forecasting of future site traffic:

To/From:	Residential	Commercial
West on Lee Highway/Fairfax Boulevard:	35%	35%
Northeast on Fairfax Boulevard:	50%	45%
Southeast on Main Street:	15%	15%
North on Fairchester Drive/Meredith Drive	0%	5%
TOTAL	100%	100%

Figure 6-1 graphically illustrates this trip distribution.

**Site Trip Assignments**

The assignments of the total vehicle trips generated upon the future build-out of the Breezeway Property redevelopment was based on the above distribution and are depicted on Figures 6-2A and 6-2B.

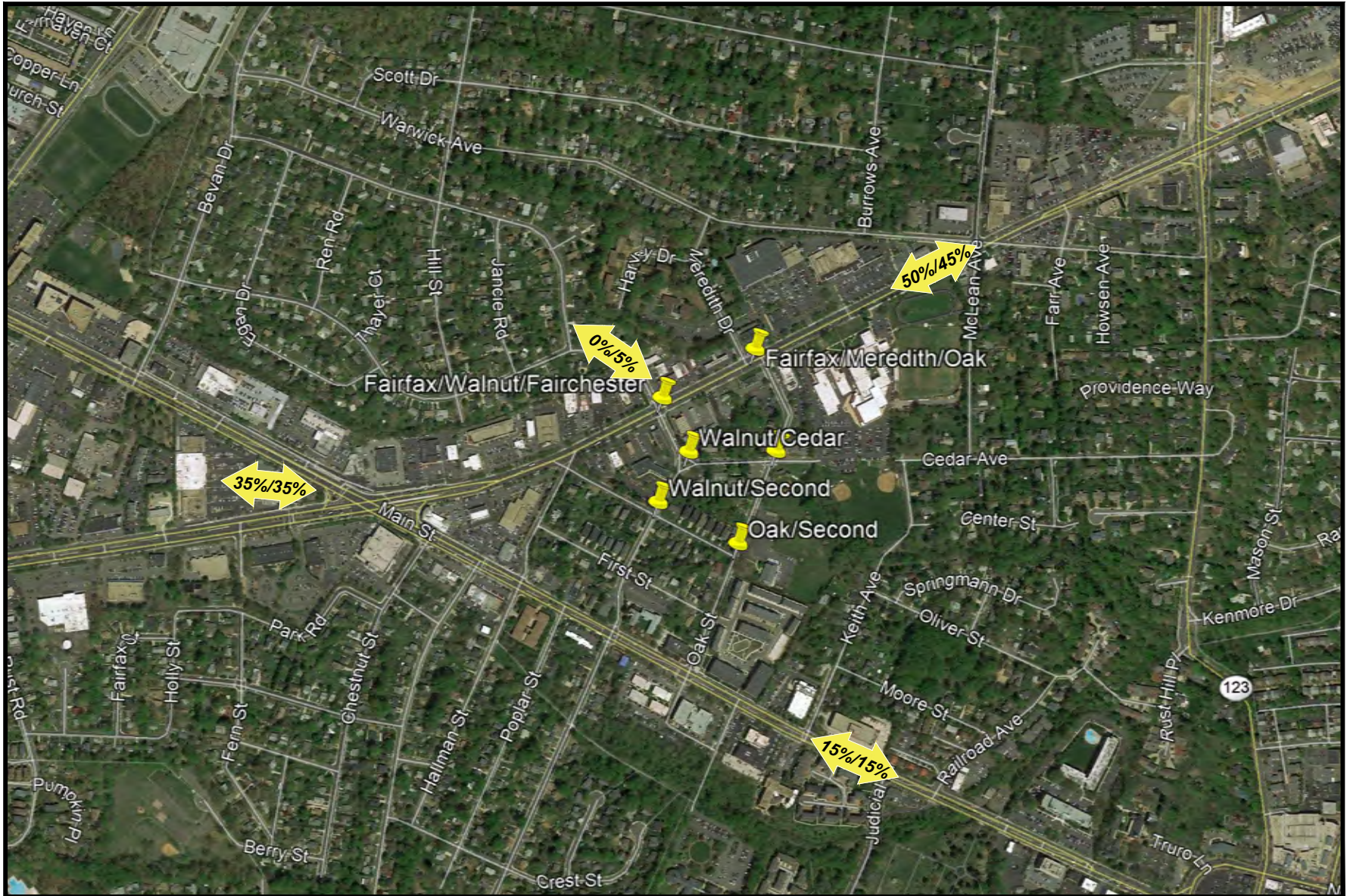


Figure 6-1  
 Site Traffic Directions of Approach  
 Breezeway Property



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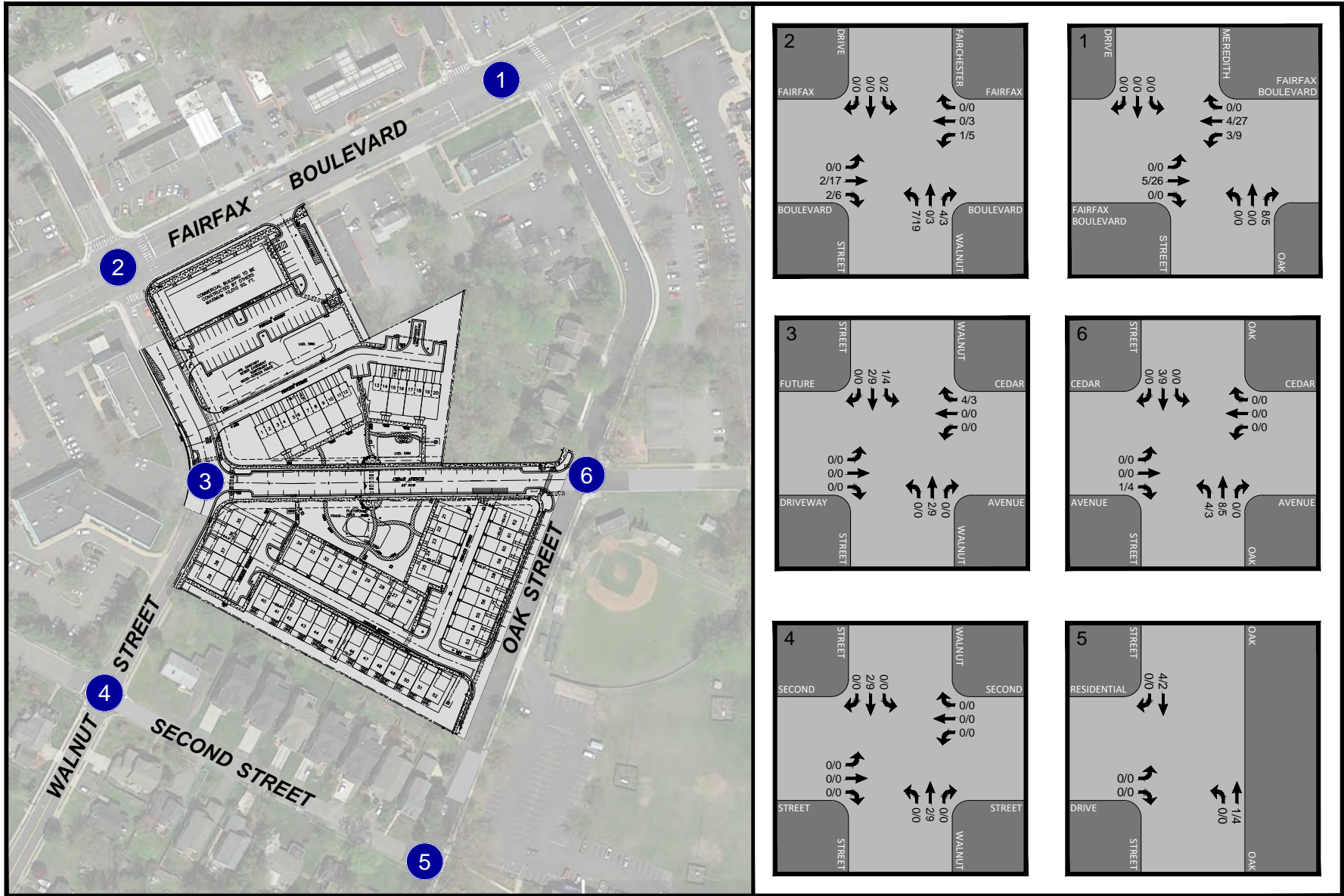


Figure 6-2A  
2024 Site Traffic Assignments (Residential & Commercial)  
Study Intersections

AM PEAK HOUR  
PM PEAK HOUR  
000 / 000



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Figure 6-2B  
 Site Traffic Assignments (Residential & Commercial)  
 Site Driveways

AM PEAK HOUR  
 PM PEAK HOUR  
 000 / 000



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## SECTION 7 ANALYSIS OF FUTURE CONDITIONS WITH SITE DEVELOPMENT

### Total Future Traffic Forecasts

Site trip assignments shown on Figures 6-2A and 6-2B were added to the background traffic forecasts to yield 2024 total future traffic forecasts, shown on Figures 7-1A and 7-1B.

### Proposed Improvements

The design of the existing Walnut Street/Cedar Avenue intersection is not conventional. The Walnut Street and Cedar Avenue approaches are separated by a triangular median island. Two-way traffic is permitted along each side of the median island that results in multiple conflict points and is potentially confusing to drivers as to who has right-of-way when traversing the intersection. The Applicant intends to improve this situation by reconstructing the intersection as a four-leg, stop controlled intersection. This redesign will enhance vehicular, pedestrian and bicycle safety.

Additionally, access to the existing Breezeway Motel is currently provided at two locations along Fairfax Boulevard. The Applicant intends to consolidate these access drives to a single location providing enhanced access management along this arterial roadway.

Lane use and traffic control at each of the study intersections for 2024 total future conditions is shown on Figure 7-2A and 7-2B.

### Total Future Levels of Service with Proposed Development Plan

Future levels of service with the proposed development plan were determined at the study intersections based on the future traffic volumes shown on Figures 7-1A and 7-1B, future lane use and traffic control shown on Figures 7-2A and 7-2B, and the 2000 HCM methodologies for signalized and unsignalized intersections calculated using the Synchro 10 traffic analysis software. The results of these analyses are provided in Appendix E and summarized in Table 7-1.

As shown in Table 7-1, levels of service under future site development conditions would remain generally consistent with future background conditions (i.e., without site development).

The analyses show that the signalized intersections along Fairfax Boulevard will continue to operate at level of service “C” (LOS “C”) or better during the AM and PM peak commuter periods. The side street approaches to the signalized intersections will continue to operate at LOS “E” and “F” with average delays between 75 seconds and 110 seconds. However, the volume-to-capacity (v/c) ratios for the side street approaches at intersections along Fairfax Boulevard will be well below 1.0, indicating that the lengthy delays will be the result of long cycle lengths (190 seconds during the AM commuter peak hour and 220 seconds during the PM commuter peak hours) and the assignment of the predominance of the green time to the Fairfax Boulevard approaches, rather than insufficient capacity. These analyses results are consistent with the previous study submissions.

Each of the approaches at the unsignalized intersections of Walnut Street/Second Street, Oak Street/Second Street, Walnut Street/Cedar Avenue, and Oak Street/Cedar Avenue – Panther Place will operate at LOS “A” during each of the peak periods.

As previously noted, an additional alternative analysis is included in Appendix F that also includes the potential redevelopment of the (not currently approved) American Legion (Toll Brothers) redevelopment on the east side of Oak Street as a pipeline development. Those alternative future analyses also include potential future improvements (by others) along the northbound travelway on Walnut Street to include a bike lane and the reduction from two northbound lanes to one northbound lane between Cedar Avenue and Fairfax Boulevard. The results of these additional analyses are generally consistent with the results summarized in Table 7-1 below with additions to overall intersection delays of less than 2 seconds/vehicle.

**Table 7-1**  
 Breezeway Property  
 Total Future Intersection Capacity Analysis Summary

Intersection	Intersection Control	Approach	Existing		Background Future		Total Future	
			AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
1. Fairfax Boulevard & Meredith Drive/Oak Street	Signal	EB Appr	B (17.8)	A (8.8)	B (17.2)	A (8.1)	B (18.5)	A (9.3)
		WB Appr	B (14.9)	B (17.3)	B (13.8)	B (17.2)	B (14.2)	B (17.6)
		NB Appr	F (87.1)	F (100.2)	F (84.4)	F (100.3)	F (84.3)	F (100.3)
		SB Appr	F (88.4)	F (102.4)	F (88.3)	F (104.7)	F (88.3)	F (104.7)
		Overall	C (21.2)	B (18.7)	C (20.3)	B (17.9)	C (21.5)	B (18.6)
2. Fairfax Boulevard & Fairchester Drive/Walnut Street	Signal	EB Appr	B (13.0)	A (8.0)	B (12.8)	A (8.3)	B (12.9)	A (8.6)
		WB Appr	A (3.0)	A (1.7)	A (2.8)	A (1.7)	A (2.6)	B (11.9)
		NB Appr	E (76.5)	F (90.3)	E (76.6)	F (90.4)	E (76.5)	F (90.7)
		SB Appr	F (92.7)	F (105.7)	F (91.7)	F (103.9)	F (92.9)	F (105.9)
		Overall	B (14.6)	A (9.4)	B (14.0)	A (8.9)	B (14.3)	B (15.4)
3. Walnut Street/Cedar Avenue	Stop	EB Appr	A (0.0)	A (9.4)	B (10.7)	A (9.4)	B (10.8)	A (7.3)
		WB Appr	A (9.4)	A (9.6)	A (9.4)	A (9.5)	A (9.4)	A (7.4)
		NB Appr	A (0.4)	A (0.1)	A (0.4)	A (0.1)	A (0.4)	A (7.6)
		SB Appr	A (3.2)	A (1.5)	A (3.3)	A (1.7)	A (3.3)	A (7.8)
		Overall	A (2.4)	A (2.5)	A (2.6)	A (2.5)	A (2.6)	A (7.6)
4. Walnut Street/Second Street	Stop	EB Appr	A (7.5)	A (7.3)	A (7.4)	A (7.3)	A (7.4)	A (7.4)
		WB Appr	A (7.2)	A (7.3)	A (7.2)	A (7.3)	A (7.2)	A (7.3)
		NB Appr	A (7.8)	A (7.5)	A (7.8)	A (7.5)	A (7.8)	A (7.6)
		SB Appr	A (7.5)	A (7.7)	A (7.4)	A (7.6)	A (7.5)	A (7.7)
		Overall	A (7.7)	A (7.6)	A (7.6)	A (7.5)	A (7.6)	A (7.6)
5. Oak Street/Second Street	Stop	EB Appr	A (7.0)	A (7.1)	A (7.0)	A (7.1)	A (7.1)	A (7.1)
		NB Appr	A (7.7)	A (7.7)	A (7.8)	A (7.8)	A (7.8)	A (7.9)
		SB Appr	A (7.8)	A (7.7)	A (7.9)	A (7.8)	A (7.9)	A (7.8)
		Overall	A (7.7)	A (7.7)	A (7.8)	A (7.8)	A (7.8)	A (7.8)
6. Oak Street/Cedar Avenue/Panther Place	Stop	EB Appr	A (8.1)	A (7.6)	A (8.1)	A (7.6)	A (8.2)	A (7.6)
		WB Appr	A (8.0)	A (7.5)	A (8.3)	A (7.8)	A (8.3)	A (7.8)
		NB Appr	A (8.1)	A (7.9)	A (8.2)	A (8.0)	A (8.3)	A (8.1)
		SB Appr	A (8.4)	A (7.9)	A (8.5)	A (8.0)	A (8.5)	A (8.1)
		Overall	A (8.2)	A (7.8)	A (8.3)	A (7.9)	A (8.3)	A (8.0)
A. Fairfax Boulevard/ Site Driveway	Stop	EB Appr	Future Intersection		Future Intersection		A (0.0)	A (0.0)
		WB Appr	Future Intersection		Future Intersection		A (0.1)	A (6.2)
		NB Appr	Future Intersection		Future Intersection		B (10.6)	B (12.8)
		Overall	Future Intersection		Future Intersection		B (0.0)	A (0.5)
B. Walnut Street/ Commercial Site Driveway	Stop	WB Appr	Future Intersection		Future Intersection		A (8.7)	A (9.1)
		NB Appr	Future Intersection		Future Intersection		A (0.0)	A (0.0)
		SB Appr	Future Intersection		Future Intersection		A (0.0)	A (0.0)
		Overall	Future Intersection		Future Intersection		A (0.0)	A (1.1)
C. Walnut Street/ Residential Site Driveway	Stop	WB Appr	Future Intersection		Future Intersection		A (9.2)	A (9.0)
		NB Appr	Future Intersection		Future Intersection		A (0.0)	A (0.0)
		SB Appr	Future Intersection		Future Intersection		A (0.2)	A (0.5)
		Overall	Future Intersection		Future Intersection		A (0.4)	A (0.5)
D. Oak Street/ Residential Driveway	Stop	EB Appr	Future Intersection		Future Intersection		B (10.0)	B (10.0)
		NB Appr	Future Intersection		Future Intersection		A (0.1)	A (0.2)
		SB Appr	Future Intersection		Future Intersection		A (0.0)	A (0.0)
		Overall	Future Intersection		Future Intersection		A (0.6)	A (0.4)

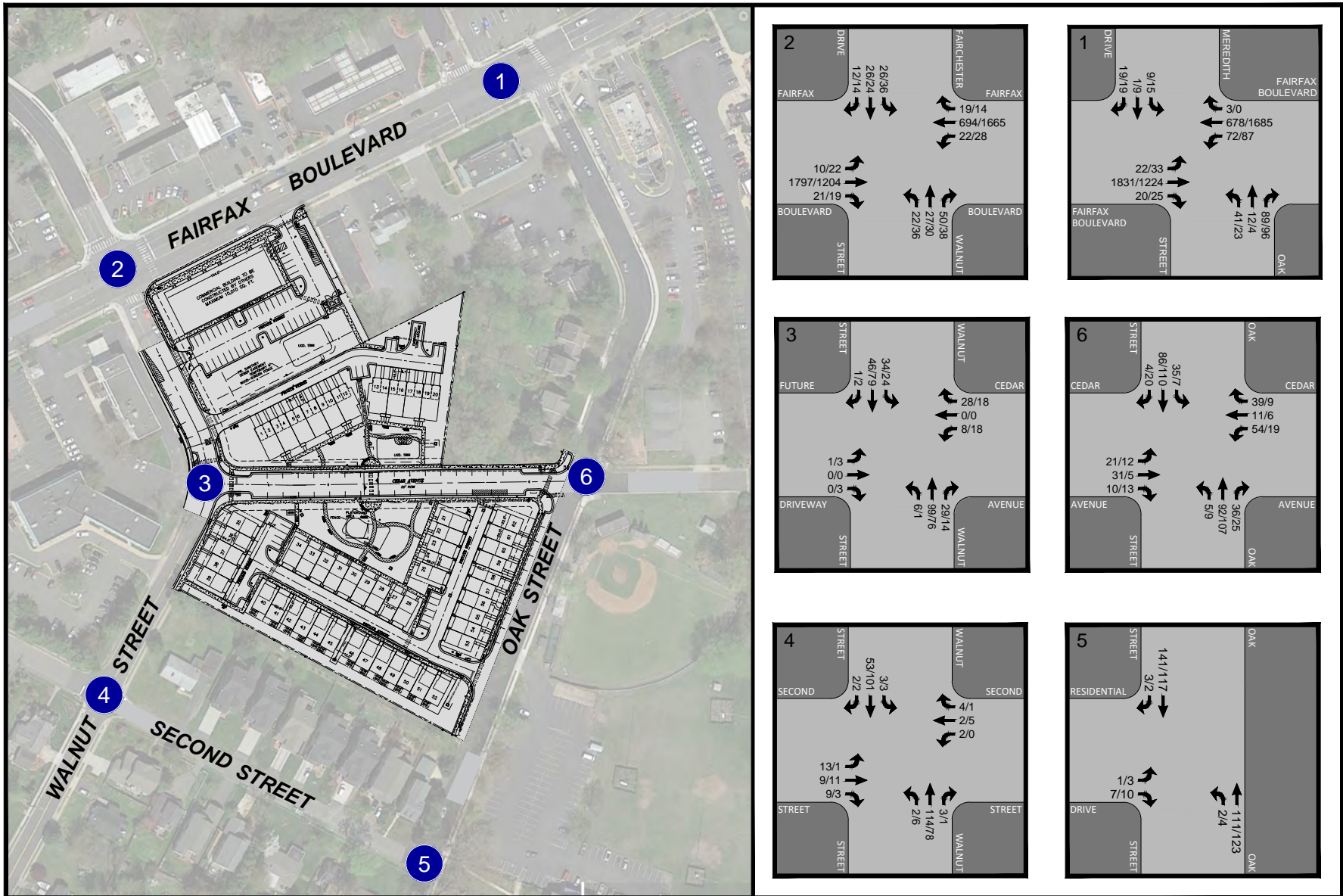


Figure 7-1A  
2024 Total Future Peak Hour Traffic Forecasts  
Study Intersections

AM PEAK HOUR  
PM PEAK HOUR  
000 / 000



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Figure 7-1B  
 2024 Total Future Peak hour Traffic Forecasts  
 Site Driveways

AM PEAK HOUR  
 PM PEAK HOUR  
 000 / 000



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Figure 7-2A  
2024 Total Future Lane Use, Traffic Control and Levels of Service  
Study Intersections

- Approach LOS - AM/PM
- Intersection LOS - AM/PM
- Represents One Travel Lane
- Signalized Intersection
- Stop Sign



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Figure 7-2B  
2024 Total Future Lane Use, Traffic Control and Levels of Service  
Site Driveways

- Approach LOS - AM/PM  
 - Intersection LOS - AM/PM

Represents One Travel Lane  
 Signaled Intersection  
 Stop Sign



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## SECTION 8 CONCLUSIONS

Based on the results of this revised traffic impact study, the following may be concluded:

1. The Fairfax Boulevard/Oak Street – Meredith Drive and Fairfax Boulevard/Walnut Street – Fairchester Drive signalized intersections currently operate at an overall LOS “C” or better during the AM and PM commuter peak periods based on Highway Capacity Manual calculations using the Synchro 10 traffic analysis software. Side street approaches at these intersections currently operate at LOS “E” or “F” during the peak periods due to long cycle lengths and the assignment of most of the green time to the Fairfax Boulevard approaches.
2. Historic VDOT traffic data indicates that average daily traffic counts along Fairfax Boulevard have increased by approximately 0.55% per year between 2013 and 2018.
3. The Novus Fairfax Gateway (Fairfield at Gateway - The Moxley) and Paul VI Redevelopment approved pipeline developments are anticipated to generate 543 AM commuter peak hour trips and 912 PM commuter peak hour trips at full buildout.
4. Under future 2024 traffic conditions, minimal increases in delay at the study intersections are expected due to the trips generated by approved pipeline developments in the vicinity of the site and overall levels of service would remain generally consistent with existing conditions.
5. The site is currently developed with the 50-room Breezeway Motel, the 38-unit Fairfax Garden Apartments, and four (4) single family homes.
6. The Applicant proposes to redevelop the site with 62 residential townhouse units and up to 10,010 SF of commercial uses.
7. The project is estimated to generate 40 AM peak commuter hour trips and 140 PM peak commuter hour trips upon buildout.
8. Under future 2024 traffic conditions, with the development of the subject site, intersection levels of service would remain generally consistent with existing and background conditions. The analyses show that the Fairfax Boulevard signalized intersections will continue to operate at LOS “C” or better during the AM and PM commuter peak periods.
9. All unsignalized intersection and access drive approaches will operate at LOS “B” or better during each of the studied peak periods.
10. Access to the commercial portion of the site will be via one full access driveway along Fairfax Boulevard and one right-in/right-out/left-out driveway on Walnut Street. Access to the northern residential portion of the site will be provided via one full access



driveway along Walnut Street. Access to the southern residential portion of the site will be provided via one full access driveway along Oak Street.

11. The Applicant intends to improve the roadway geometrics at the Walnut Street/Cedar Avenue intersection by reconstructing the intersection as a four-leg, stop controlled intersection in order to enhance vehicular, pedestrian and bicycle safety.
12. Access to the existing Breezeway Motel is currently provided at two locations along Fairfax Boulevard. The Applicant intends to consolidate these access drives to a single location providing enhanced access management along this arterial roadway.
13. An updated alternative analysis has been added in this revision of the study to include the added impact of the potential redevelopment of the American Legion (Toll Brothers) site on the east side of Oak Street per the latest available development proposal for that site. Since the application for that redevelopment is not currently approved, this additional assessment is provided for informational purposes. Further, as requested by Staff, the Applicant has coordinated with the developer of that site to better align the Oak Street site driveway with their relocated driveway. Also included in this alternative assessment are potential future improvements (by others) along Walnut Street to include a bike lane along the northbound travelway. The results of these alternative analyses indicate that both background and total future conditions would be generally consistent with those presented in this study that do not include the American Legion (Toll Brothers) redevelopment or the Walnut Street bike lane improvements. This is primarily due to the relatively low increase in site traffic that would result from that redevelopment and the excess capacity along Oak Street that can adequately accommodate the additional traffic. Additional details regarding this additional alternative analysis are presented in Appendix F.

## APPENDIX A

### City of Fairfax Scoping Agreement



# SCOPE OF WORK MEETING FORM

## Information on the Project

### Traffic Impact Analysis Base Assumptions

**ROUTE 50 BREEZEWAY PROPERTY**  
**CITY OF FAIRFAX, VIRGINIA**  
**July 3, 2019**  
**Scoping Meeting Held June 25, 2019**

<b>Contact Information</b>				
Consultant Name: Tele: E-mail:	Christopher Turnbull - Wells + Associates, Inc. 703-917-6620 cturnbull@wellsandassociates.com			
Developer/Owner Name: Tele: E-mail:	Stephen S. Collins, Jr. P.E. 703.934.9369 Stephen.Collins@Pultegroup.com			
<b>Project Information</b>				
Project Name:	Route 50 Breezeway Property	Locality/County:	City of Fairfax	
Project Location: <small>(Attach regional and site specific location map)</small>	The project is generally located south of Fairfax Boulevard, between Main Street and Chain Bridge Road. See <a href="#">Attachment 1</a> for the site location.			
Submission Type	Comp Plan <input type="checkbox"/>	Rezoning <input checked="" type="checkbox"/> (SUP)	Site Plan <input type="checkbox"/>	Subd Plat <input type="checkbox"/>
Project Description: <small>(Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)</small>	The Applicant is proposing to redevelop the property with 62 residential units to include townhomes and stacked condos. And up to 10,920 square feet of commercial space. The Site Layout is provided as <a href="#">Attachment 2</a> .			
Proposed Use(s): <small>(Check all that apply; attach additional pages as necessary)</small>	Residential <input type="checkbox"/>	Commercial <input type="checkbox"/>	Mixed Use <input checked="" type="checkbox"/>	Other <input type="checkbox"/>
(See Attachment – 3)	<b>Residential Uses(s)</b> Number of Units:        62 ITE LU Code(s):        221  <b>Commercial Use(s)</b> ITE LU Code(s):        TBD  Square Ft or Other Variable: <u>10,920</u> _____		<b>Other Use(s)</b> ITE LU Code(s):        _____ _____ _____  Independent Variable(s): _____ _____ _____	
Total Peak Hour Trip Projection:	Less than 100 <input type="checkbox"/>	100 – 499 <input checked="" type="checkbox"/>	500 – 999 <input type="checkbox"/>	1,000 or more <input type="checkbox"/>

<b>Traffic Impact Analysis Assumptions</b>			
Study Period	Existing Year: 2019	Build-out Year: 2024	Design Year: n/a
Study Area Boundaries	North: Fairfax Boulevard (US Route 50)	South: Second Street	
	East: Oak Street	West: Walnut Street	
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	<ul style="list-style-type: none"> <li>• Novus Fairfax Gateway redevelopment</li> <li>• Paul VI Redevelopment</li> </ul>		
Consistency With Comprehensive Plan (Land use, transportation plan)	The proposed development conforms with the City’s 2035 Comprehensive Plan that identifies the northers portion of the site along Fairfax Boulevard as “Commercial Corridor” and the remainder of the site “Multifamily Neighborhood.” The current CR (Commercial Retail) and RMF (Residential Multifamily) would permit the proposed land uses. The roadway network is consistent with the intent of the City Transportation Plan.		
Available Traffic Data (Historical, forecasts)	<p>VDOT historical traffic count data indicates:</p> <p><u>2018 VDOT Average Annual Daily Traffic (AADT):</u> Fairfax Boulevard (US Route 50): 37,000 vpd (Main Street to Chain Bridge Road)</p> <p><u>2017 VDOT Average Annual Daily Traffic (AADT):</u> Fairfax Boulevard (US Route 50): 36,000 vpd (Main Street to Chain Bridge Road)</p> <p><u>2016 VDOT Average Annual Daily Traffic (AADT):</u> Fairfax Boulevard (US Route 50): 36,000 vpd (Main Street to Chain Bridge Road)</p> <p><u>2015 VDOT Average Annual Daily Traffic (AADT):</u> Fairfax Boulevard (US Route 50): 35,000 vpd (Main Street to Chain Bridge Road)</p> <p><u>2014 VDOT Average Annual Daily Traffic (AADT):</u> Fairfax Boulevard (US Route 50): 36,000 vpd (Main Street to Chain Bridge Road)</p> <p><u>2013 VDOT Average Annual Daily Traffic (AADT):</u> Fairfax Boulevard (US Route 50): 36,000 vpd (Main Street to Chain Bridge Road)</p>		
Trip Distribution (Pending data from existing traffic counts)(See Attachment 4)	From the West: 35%	From the Northeast: 50%Resid./45% Commercial	
	From the North: 0% Resid./5% Comm.	From the Southeast: 15%	
Annual Vehicle Trip Growth Rate:	1% or per VDOT AADT counts	Peak Period for Study (check all that apply)	<input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> PM <input type="checkbox"/> SAT
		Peak Hour of the Generator	N/A
Study Intersections and/or Road Segments (See Attachment 1)	1. Fairfax Boulevard/Meredith Drive, Oak Street	6. Oak Street/Cedar Avenue/Panther Place	
	2. Fairfax Blvd/Fairchester Drive, Walnut Street	7. Site Access Drives	
	3. Walnut Street/Cedar Avenue		
	4. Walnut Street/Second Street		
	5. Oak Street/Second Street		

Trip Adjustment Factors	Internal allowance: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Reduction: _____% trips	Pass-by allowance: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Reduction: _____%trips
Software Methodology	<input checked="" type="checkbox"/> Synchro <input type="checkbox"/> HCS (v.2000/+) <input type="checkbox"/> aaSIDRA <input type="checkbox"/> CORSIM <input type="checkbox"/> Other <u>Synchro Version 8</u>	
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	None	
Improvement(s) Assumed or to be Considered	Reconfigure Walnut Street/Cedar Avenue intersection to a conventional design.	
Background Traffic Studies Considered	<ul style="list-style-type: none"> <li>• Avalon</li> <li>• Novus Fairfax Gateway Traffic Impact Analysis</li> <li>• Paul VI Redevelopment</li> </ul>	
Plan Submission	<input checked="" type="checkbox"/> Master Development Plan (MDP) <input type="checkbox"/> Generalized Development Plan (GDP) <input type="checkbox"/> Preliminary/Sketch Plan <input type="checkbox"/> Other Plan type (Final Site, Subd. Plan)	
Additional Issues to be Addressed	<input type="checkbox"/> Queuing analysis <input type="checkbox"/> Actuation/Coordination <input type="checkbox"/> Weaving analysis <input type="checkbox"/> Merge analysis <input checked="" type="checkbox"/> Bike/Ped Accommodations <input type="checkbox"/> Intersection(s) <input type="checkbox"/> TDM Measures <input type="checkbox"/> Other _____	

NOTES on ASSUMPTIONS:

1. Synchro 8 will be used to conduct capacity analysis with peak hour factors measured in the field for existing conditions ( $0.85 < PHF < 0.92$ ). Under background and total future conditions a PHF of 0.92 will be used for all movements.
2. Existing Synchro (signal timing) files to be provided by the city.

**SCOPE OF WORK MEETING**

**ADDITIONS TO THE REQUIRED ELEMENTS, CHANGES TO THE METHODOLOGY OR  
STANDARD ASSUMPTIONS, AND SIGNATURE PAGE**

Any additions to the Required Elements or changes to the Methodology or Standard Assumptions due to special circumstances that are approved by the City of Fairfax:

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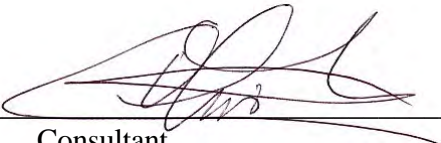
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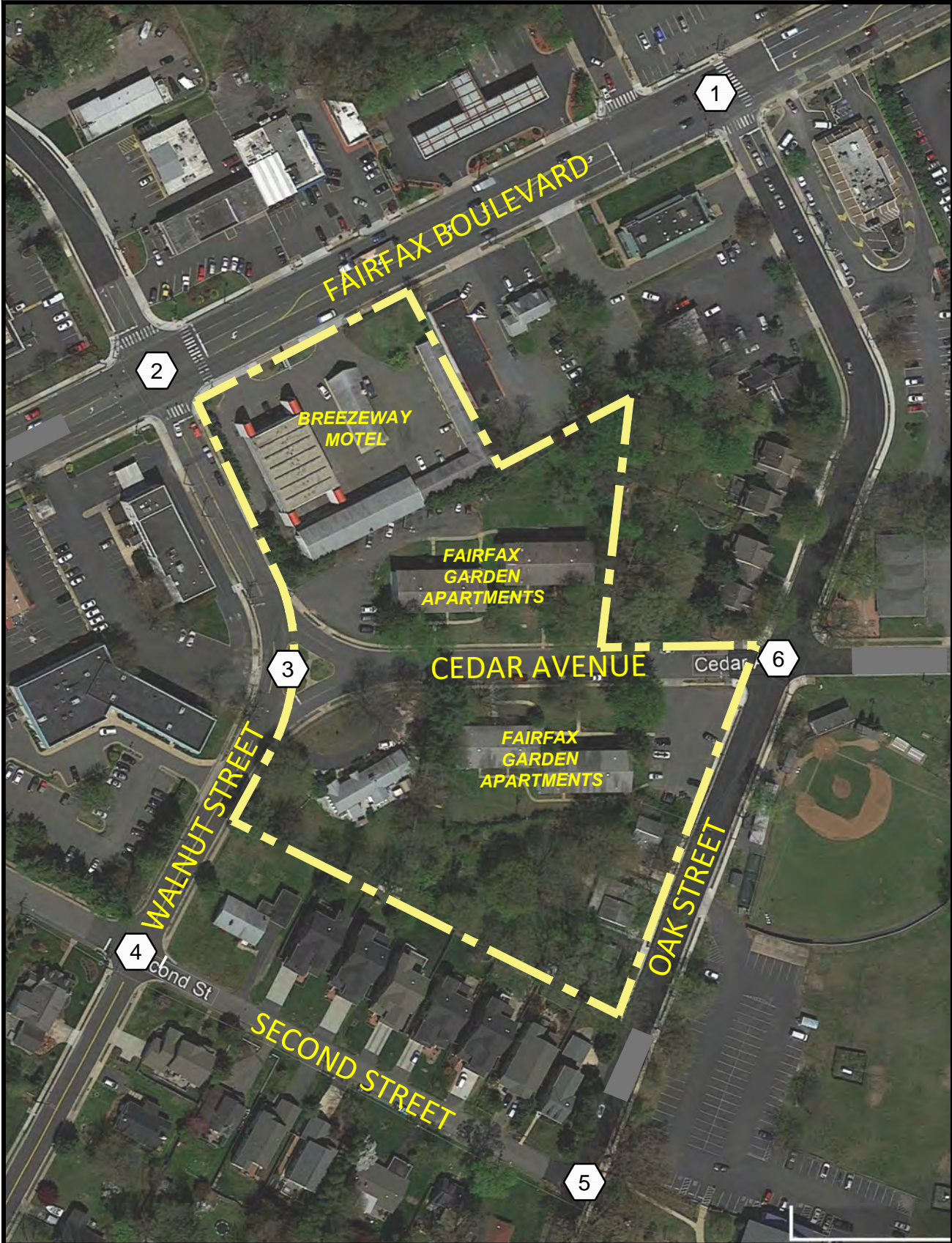
AGREED:  DATE: 07/03/2019  
 Consultant

PRINT NAME: Christopher Turnbull  
 Consultant

SIGNED: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT NAME: \_\_\_\_\_

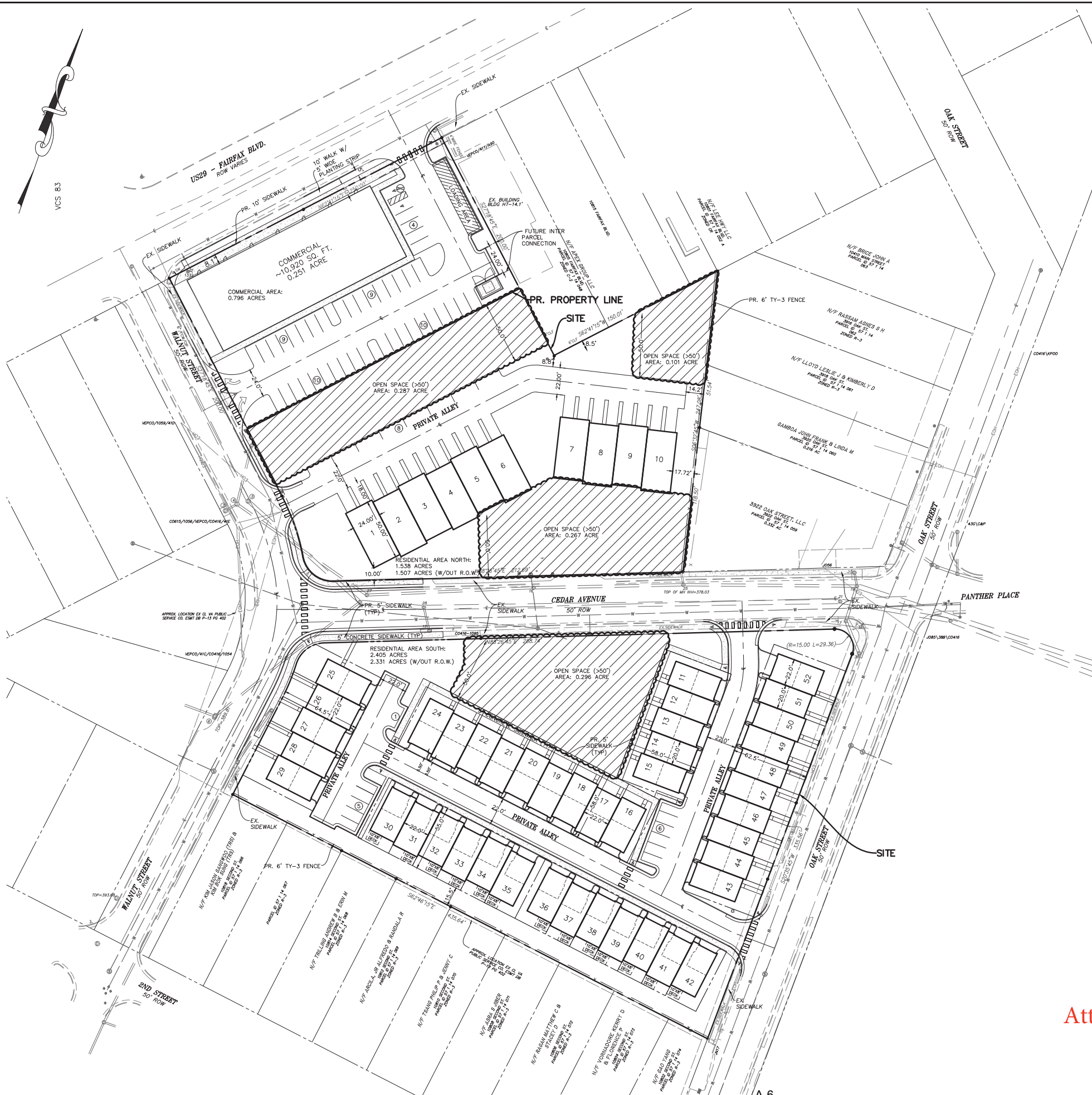
- Attachments:  
 Attachment 1 - Site Location and Study Intersections  
 Attachment 2 – Site Layout  
 Attachment 3 – Trip Generation  
 Attachment 4 – Directions of Approach



Attachment 1  
 Site Location  
 PulteGroup, Inc.  
 Breezeway Property  
 City of Fairfax, Virginia

⬡ - Study Intersection





**SITE AREA:**

- 4.739 AC W/ R.O.W. DEDICATION
- 4.634 AC W/OUT R.O.W. DEDICATION

**RESIDENTIAL:** (NORTH AND SOUTH OF CEDAR)

3.838 AC = 1.507+2.331

**COMMERCIAL:**

0.796 AC

**TOTAL OPEN SPACE REQUIRED:** 20% SITE AREA

**TOTAL OPEN SPACE PROVIDED:** 24.8%

0.287 AC + 0.101 AC + 0.267 AC + 0.296 AC = 0.9510 AC

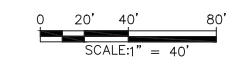
**PARKING TABULATIONS:**

PARKING TABULATIONS (PER FAIRFAX CITY ZONING ORDINANCE)				
PARKING TYPE	QUANTITY	REQUIREMENT	REQUIRED	PROVIDED
RESIDENTIAL	62 UNITS	2 SPACES/UNIT	124	TOTAL 144 20 SURFACE 104 GARAGE 20 TANDEM
COMMERCIAL	10,920 S.F.	1 SPACE/200 S.F.	55	TOTAL 44 44 SURFACE
			<b>TOTAL</b>	<b>179</b>
				<b>188</b>

**PRODUCT TYPES:**

RESIDENTIAL PRODUCT TYPES	QUANTITY
TOWN HOME - REAR LOAD 20' WIDE	14
TOWN HOME - REAR LOAD 22' WIDE	15
TOWN HOME - FRONT LOAD 22' WIDE	13
STACKED CONDO - REAR LOAD 24' WIDE (2 DU / BUILDING)	20
<b>TOTAL</b>	<b>62</b>

Attachment 2



SUBMISSION		REVISION	
NO.	DATE	NO.	DESCRIPTION

CLIENT	13861 SUNRISE VALLEY DRIVE, SUITE 200 HERNDON, VIRGINIA 20171 (703) 430-7500 FAX (703) 430-0889 HERNDON - BALTIMORE - BLACKSBURG HULLERS - RICHMOND - WASHINGTON, DC WALDORF - RICHMOND - WASHINGTON, DC WWW.ATCSPLC.COM
SITE LAYOUT	RT. 50 BREEZEWAY PROPERTY
AUTHOR:	A.A.H.
CHECK:	C.A.B.
PROJ. NO.:	001271
DATE:	4/24/2019
SCALE:	1" = 40'
LOCATION:	FAIRFAX CITY, VIRGINIA
SHEET	CS-101
SHEET:	1 OF 1



**Attachment 3**

**Breezeway Property - City of Fairfax**

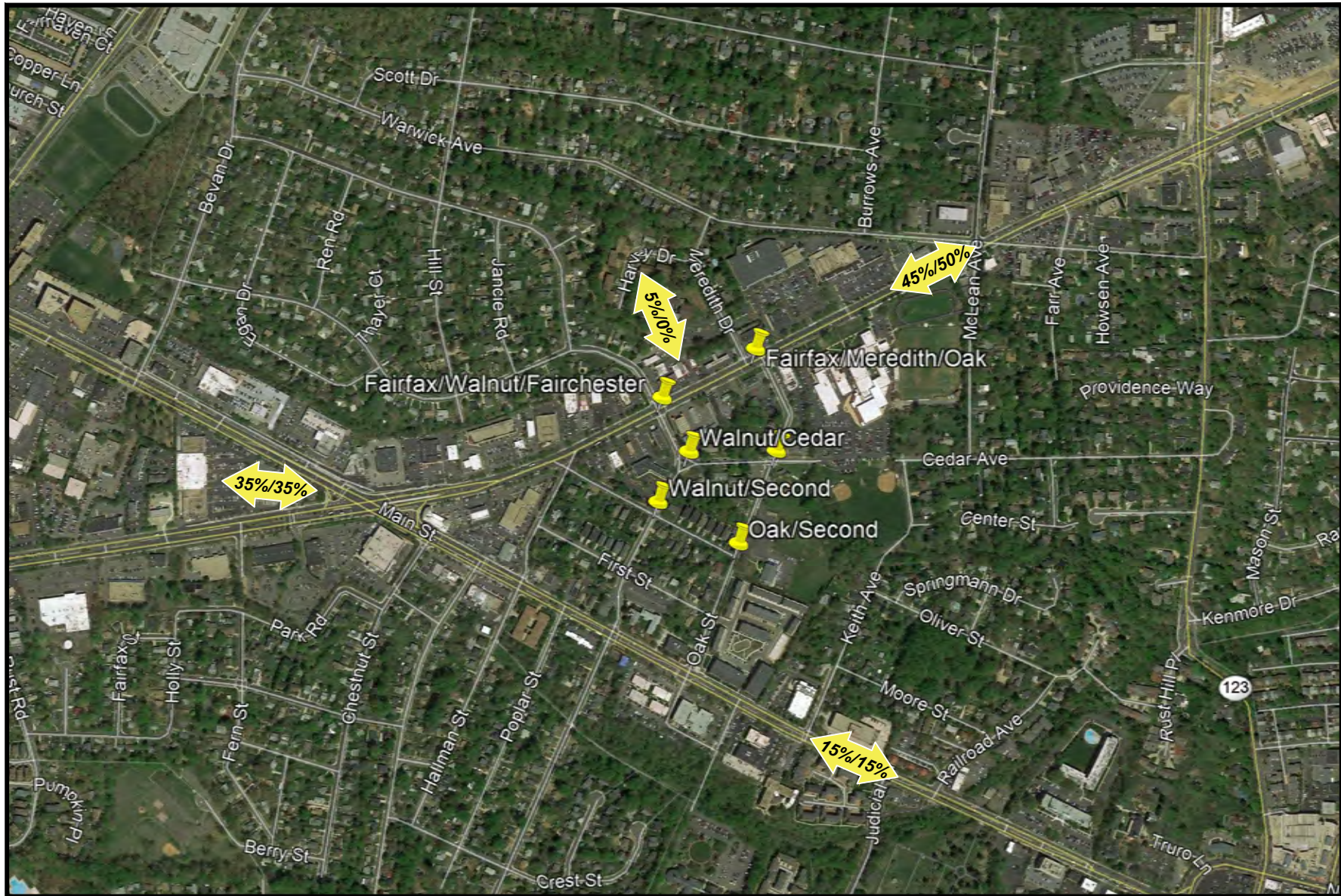
**Trip Generation Comparison Existing Residential Uses Vs. Proposed Residential Uses (1)**

Use	ITE Land Use Code	Amount	Units	AM Peak Hour			PM Peak Hour			ADT
				In	Out	Total	In	Out	Total	
<b>Existing Residential Uses</b>										
Multifamily (Low Rise) Apartments	220	6	DU's	1	2	3	3	2	5	44
Multifamily (Mid-Rise) Apartments	221	32	DU's	3	8	11	9	6	15	173
Single-Family Detached Houses	210	4	DU's	1	2	3	3	1	4	38
<b>Total Existing Uses</b>		42		5	12	17	15	9	24	255
<b>Proposed Residential Use</b>										
Residential (Mid-Rise) Town Homes	221	62	DU's	5	16	21	17	11	28	336
<b>Difference Proposed Uses Less Existing Uses</b>				0	4	4	2	2	4	81

**Trip Generation Comparison Potential Commercial Uses Vs. Existing and By-Right Commercial Uses(1)**

Use	ITE Land Use Code	Amount	Units	AM Peak Hour			PM Peak Hour			ADT
				In	Out	Total	In	Out	Total	
<b>Existing Commercial Use</b>										
Motel	320	50	Rooms	8	13	21	11	10	21	152
<b>Potential By-Right Commercial Uses (2)</b>										
<u>Allowed CR Zone Use</u>	<u>Most Similar ITE Land Use</u>									
Art Gallery or Studio	Retail Shopping Center	820	10,920 SF	6	4	10	51	55	106	1,334
Catering or Delivery Service			8,800 SF	5	3	8	43	47	90	1,152
Retail General			8,800 SF	5	3	8	43	47	90	1,152
Retail large Format			8,800 SF	5	3	8	43	47	90	1,152
Shopping Centers			8,800 SF	5	3	8	43	47	90	1,152
Tobacco and Smoke Shop			8,800 SF	5	3	8	43	47	90	1,152
Services General			8,800 SF	5	3	8	43	47	90	1,152
Services Personal			8,800 SF	5	3	8	43	47	90	1,152
Building Supplies and Lumber Sales	Building Materials and Lumber Store	812	10,920 SF	11	6	17	11	11	22	N/A
Furniture, Appliance or carpeting/flooring store	Furniture Store	890	10,920 SF	3	1	4	3	3	6	103
Office, General	General Office	710	10,920 SF	11	2	13	2	12	14	106
Office, Medical	Medical-Dental Office	720	8,800 SF	20	6	26	9	23	32	250
Schools, technical, trade, business	Junior/Community College	540	10,920 SF	47	14	61	10	10	20	221
Brew Pub	Drinking Place	925	10,920 SF	0	0	0	82	42	124	N/A
Restaurant or Food Service	Quality Restaurant	931	8,800 SF	3	3	6	46	23	69	738
	High-Turnover Restaurant	932	8,800 SF	48	39	87	53	33	86	987
Day Care/Nursery School	Day Care Center	565	8,800 SF	51	46	97	46	52	98	419

Notes: (1) Based on Institute of Transportation Engineers', Trip Generation, 10th Edition  
 (2) Square footage based on ability to surface park use.



Attachment 4  
Directions of Approach  
Breezeway Property



- Commercial / Residential



NORTH

Pulte Group, Inc.  
City of Fairfax, Virginia



# APPENDIX B

## Existing Traffic Volumes

# Wells + Associates, Inc.

McLean, Virginia

## Turning Movement Count - All Vehicles

Time Period		Southbound Meredith Drive					Westbound Fairfax Boulevard					Northbound Oak Street					Eastbound Fairfax Boulevard					North & South	East & West	Total																								
		Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF																											
<b>PROJECT:</b> Pulte Homes Breezeway - City of Fairfax																						<b>DATE:</b> 7/11/2019					<b>SOUTHBOUND ROAD:</b> Meredith Drive																					
<b>W+A JOB NO:</b> 7476																						<b>DAY:</b> Thursday					<b>NORTHBOUND ROAD:</b> Oak Street																					
<b>INTERSECTION:</b> Fairfax Boulevard & Meredith Drive/Oak Street																						<b>WEATHER:</b> clear					<b>WESTBOUND ROAD:</b> Fairfax Boulevard																					
<b>LOCATION:</b> City of Fairfax, VA																						<b>COUNTED BY:</b> Halid & Salih					<b>EASTBOUND ROAD:</b> Fairfax Boulevard																					
																						<b>INPUTED BY:</b> Dyrone																										
<b>AM 15 Minute Volumes</b>																																																
6:00 AM - 6:15 AM		0	0	0	0		1	46	7	54		8	0	0	8		2	220	3	225		8	279	287																								
6:15 AM - 6:30 AM		5	0	4	9		1	44	5	50		5	0	1	6		3	345	4	352		15	402	417																								
6:30 AM - 6:45 AM		3	0	2	5		0	65	2	67		8	1	5	14		0	396	1	397		19	464	483																								
6:45 AM - 7:00 AM		2	0	1	3		0	82	4	86		11	0	3	14		3	406	1	410		17	496	513																								
7:00 AM - 7:15 AM		4	0	3	7		0	99	3	102		17	1	4	22		2	393	4	399		29	501	530																								
7:15 AM - 7:30 AM		3	0	0	3		0	117	10	127		9	1	6	16		0	412	3	415		19	542	561																								
7:30 AM - 7:45 AM		4	0	2	6		0	122	10	132		21	0	7	28		2	399	4	405		34	537	571																								
7:45 AM - 8:00 AM		8	1	3	12		0	133	16	149		14	1	4	19		2	386	3	391		31	540	571																								
8:00 AM - 8:15 AM		3	0	1	4		0	131	17	148		21	4	7	32		0	448	7	455		36	603	639																								
8:15 AM - 8:30 AM		4	0	2	6		1	150	21	172		17	3	6	26		1	400	5	406		32	578	610																								
8:30 AM - 8:45 AM		9	0	0	9		2	132	17	151		20	4	9	33		5	468	5	478		42	629	671																								
8:45 AM - 9:00 AM		2	1	6	9		0	143	12	155		21	1	16	38		12	370	4	386		47	541	588																								
<b>Total</b>		<b>47</b>	<b>2</b>	<b>24</b>	<b>73</b>		<b>5</b>	<b>1264</b>	<b>124</b>	<b>1393</b>		<b>172</b>	<b>16</b>	<b>68</b>	<b>256</b>		<b>32</b>	<b>4643</b>	<b>44</b>	<b>4719</b>		<b>329</b>	<b>6112</b>	<b>6441</b>																								
<b>AM One Hour Volumes</b>																																																
6:00 AM - 7:00 AM		10	0	7	17	0.47	2	237	18	257	0.75	32	1	9	42	0.75	8	1367	9	1384	0.84	59	1641	1700																								
6:15 AM - 7:15 AM		14	0	10	24	0.67	1	290	14	305	0.75	41	2	13	56	0.64	8	1540	10	1558	0.95	80	1863	1943																								
6:30 AM - 7:30 AM		12	0	6	18	0.64	0	363	19	382	0.75	45	3	18	66	0.75	5	1607	9	1621	0.98	84	2003	2087																								
6:45 AM - 7:45 AM		13	0	6	19	0.68	0	420	27	447	0.85	58	2	20	80	0.71	7	1610	12	1629	0.98	99	2076	2175																								
7:00 AM - 8:00 AM		19	1	8	28	0.58	0	471	39	510	0.86	61	3	21	85	0.76	6	1590	14	1610	0.97	113	2120	2233																								
7:15 AM - 8:15 AM		18	1	6	25	0.52	0	503	53	556	0.93	65	6	24	95	0.74	4	1645	17	1666	0.92	120	2222	2342																								
7:30 AM - 8:30 AM		19	1	8	28	0.58	1	536	64	601	0.87	73	8	24	105	0.82	5	1633	19	1657	0.91	133	2258	2391																								
7:45 AM - 8:45 AM		24	1	6	31	0.65	3	546	71	620	0.90	72	12	26	110	0.83	8	1702	20	1730	0.90	141	2350	2491																								
<b>8:00 AM - 9:00 AM</b>		<b>18</b>	<b>1</b>	<b>9</b>	<b>28</b>	<b>0.78</b>	<b>3</b>	<b>556</b>	<b>67</b>	<b>626</b>	<b>0.91</b>	<b>79</b>	<b>12</b>	<b>38</b>	<b>129</b>	<b>0.85</b>	<b>18</b>	<b>1686</b>	<b>21</b>	<b>1725</b>	<b>0.90</b>	<b>157</b>	<b>2351</b>	<b>2508</b>																								
<b>PM 15 Minute Volumes</b>																																																
4:00 PM - 4:15 PM		3	0	5	8		0	338	14	352		21	2	3	26		7	377	4	388		34	740	774																								
4:15 PM - 4:30 PM		2	0	0	2		0	311	13	324		27	0	7	34		7	229	11	247		36	571	607																								
4:30 PM - 4:45 PM		6	3	6	15		0	336	21	357		27	2	7	36		5	199	8	212		51	569	620																								
4:45 PM - 5:00 PM		7	6	4	17		0	310	28	338		13	0	4	17		3	226	9	238		34	576	610																								
5:00 PM - 5:15 PM		13	2	4	19		1	201	16	218		20	0	6	26		5	202	6	213		45	431	476																								
5:15 PM - 5:30 PM		3	2	4	9		3	195	14	212		19	1	7	27		7	192	7	206		36	418	454																								
5:30 PM - 5:45 PM		1	3	2	6		1	327	19	347		22	2	6	30		13	170	2	185		36	532	568																								
5:45 PM - 6:00 PM		13	5	5	23		1	313	20	334		19	2	3	24		3	156	7	166		47	500	547																								
6:00 PM - 6:15 PM		11	1	5	17		1	310	18	329		15	2	2	19		7	150	6	163		36	492	528																								
6:15 PM - 6:30 PM		8	4	6	18		3	318	17	338		6	3	4	13		0	198	10	208		31	546	577																								
6:30 PM - 6:45 PM		19	2	2	23		3	272	11	286		12	0	2	14		3	194	11	208		37	494	531																								
6:45 PM - 7:00 PM		19	1	7	27		0	253	16	269		10	0	5	15		6	162	5	173		42	442	484																								
<b>Total</b>		<b>105</b>	<b>29</b>	<b>50</b>	<b>184</b>		<b>13</b>	<b>3484</b>	<b>207</b>	<b>3704</b>		<b>211</b>	<b>14</b>	<b>56</b>	<b>281</b>		<b>66</b>	<b>2455</b>	<b>86</b>	<b>2607</b>		<b>465</b>	<b>6311</b>	<b>6776</b>																								
<b>PM One Hour Volumes</b>																																																
4:00 PM - 5:00 PM		18	9	15	42	0.62	0	1295	76	1371	0.96	88	4	21	113	0.78	22	1031	32	1085	0.70	155	2456	2611																								
4:15 PM - 5:15 PM		28	11	14	53	0.70	1	1158	78	1237	0.87	87	2	24	113	0.78	20	856	34	910	0.92	166	2147	2313																								
4:30 PM - 5:30 PM		29	13	18	60	0.79	4	1042	79	1125	0.79	79	3	24	106	0.74	20	819	30	869	0.91	166	1994	2160																								
4:45 PM - 5:45 PM		24	13	14	51	0.67	5	1033	77	1115	0.80	74	3	23	100	0.83	28	790	24	842	0.88	151	1957	2108																								
5:00 PM - 6:00 PM		30	12	15	57	0.62	6	1036	69	1111	0.80	80	5	22	107	0.89	28	720	22	770	0.90	164	1881	2045																								
5:15 PM - 6:15 PM		28	11	16	55	0.60	6	1145	71	1222	0.88	75	7	18	100	0.83	30	668	22	720	0.87	155	1942	2097																								
5:30 PM - 6:30 PM		33	13	18	64	0.70	6	1268	74	1348	0.97	62	9	15	86	0.72	23	674	25	722	0.87	150	2070	2220																								
5:45 PM - 6:45 PM		51	12	18	81	0.88	8	1213	66	1287	0.95	52	7	11	70	0.73	13	698	34	745	0.90	151	2032	2183																								
6:00 PM - 7:00 PM		57	8	20	85	0.79	7	1153	62	1222	0.90	43	5	13	61	0.80	16	704	32	752	0.90	146	1974	2120																								

# Wells + Associates, Inc.

McLean, Virginia

## Turning Movement Count - All Vehicles

Time Period		Southbound Fairchester Drive					Westbound Fairfax Boulevard					Northbound Walnut Street					Eastbound Fairfax Boulevard					North & South	East & West	Total																								
		Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF																											
<b>PROJECT:</b> Pulte Homes Breezeway - City of Fairfax																						<b>DATE:</b> 7/11/2019					<b>SOUTHBOUND ROAD:</b> Fairchester Drive																					
<b>W+A JOB NO:</b> 7476																						<b>DAY:</b> Thursday					<b>NORTHBOUND ROAD:</b> Walnut Street																					
<b>INTERSECTION:</b> Fairfax Boulevard & Fairchester Drive/Walnut Street																						<b>WEATHER:</b> clear					<b>WESTBOUND ROAD:</b> Fairfax Boulevard																					
<b>LOCATION:</b> City of Fairfax, VA																						<b>COUNTED BY:</b> James & Inita					<b>EASTBOUND ROAD:</b> Fairfax Boulevard																					
																						<b>INPUTED BY:</b> Dyron																										
<b>AM 15 Minute Volumes</b>																																																
6:00 AM - 6:15 AM		3	0	4	7		4	41	0	45		7	0	0	7		1	219	1	221		14	266	280																								
6:15 AM - 6:30 AM		5	4	5	14		4	57	0	61		4	1	2	7		0	329	1	330		21	391	412																								
6:30 AM - 6:45 AM		6	0	5	11		4	56	1	61		9	1	2	12		1	390	3	394		23	455	478																								
6:45 AM - 7:00 AM		8	34	6	48		3	74	3	80		15	1	0	16		1	271	70	342		64	422	486																								
7:00 AM - 7:15 AM		11	3	6	20		3	76	3	82		10	2	2	14		2	384	2	388		34	470	504																								
7:15 AM - 7:30 AM		5	2	6	13		3	127	12	142		15	4	2	21		0	348	1	349		34	491	525																								
7:30 AM - 7:45 AM		2	8	6	16		3	119	3	125		13	0	1	14		0	414	2	416		30	541	571																								
7:45 AM - 8:00 AM		8	4	4	16		8	174	6	188		8	5	2	15		8	363	2	373		31	561	592																								
8:00 AM - 8:15 AM		0	3	3	6		3	142	5	150		10	8	5	23		1	452	0	453		29	603	632																								
8:15 AM - 8:30 AM		3	14	9	26		5	131	3	139		18	4	3	25		4	416	1	421		51	560	611																								
8:30 AM - 8:45 AM		1	4	9	14		2	159	6	167		9	9	3	21		4	430	7	441		35	608	643																								
8:45 AM - 9:00 AM		0	7	7	14		6	155	5	166		11	5	8	24		29	308	6	343		38	509	547																								
<b>Total</b>		52	83	70	205		48	1311	47	1406		129	40	30	199		51	4324	96	4471		404	5877	6281																								
<b>AM One Hour Volumes</b>																																																
6:00 AM - 7:00 AM		22	38	20	80	0.42	15	228	4	247	0.77	35	3	4	42	0.66	3	1209	75	1287	0.82	122	1534	1656																								
6:15 AM - 7:15 AM		30	41	22	93	0.48	14	263	7	284	0.87	38	5	6	49	0.77	4	1374	76	1454	0.92	142	1738	1880																								
6:30 AM - 7:30 AM		30	39	23	92	0.48	13	333	19	365	0.64	49	8	6	63	0.75	4	1393	76	1473	0.93	155	1838	1993																								
6:45 AM - 7:45 AM		26	47	24	97	0.51	12	396	21	429	0.76	53	7	5	65	0.77	3	1417	75	1495	0.90	162	1924	2086																								
7:00 AM - 8:00 AM		26	17	22	65	0.81	17	496	24	537	0.71	46	11	7	64	0.76	10	1509	7	1526	0.92	129	2063	2192																								
7:15 AM - 8:15 AM		15	17	19	51	0.80	17	562	26	605	0.80	46	17	10	73	0.79	9	1577	5	1591	0.88	124	2196	2320																								
7:30 AM - 8:30 AM		13	29	22	64	0.62	19	566	17	602	0.80	49	17	11	77	0.77	13	1645	5	1663	0.92	141	2265	2406																								
7:45 AM - 8:45 AM		12	25	25	62	0.60	18	606	20	644	0.86	45	26	13	84	0.84	17	1661	10	1688	0.93	146	2332	2478																								
8:00 AM - 9:00 AM		4	28	28	60	0.58	16	587	19	622	0.93	48	26	19	93	0.93	38	1606	14	1658	0.92	153	2280	2433																								
<b>PM 15 Minute Volumes</b>																																																
4:00 PM - 4:15 PM		3	4	13	20		2	382	6	390		9	8	3	20		1	272	7	280		40	670	710																								
4:15 PM - 4:30 PM		4	4	1	9		4	344	5	353		8	4	4	16		3	218	10	231		25	584	609																								
4:30 PM - 4:45 PM		2	9	14	25		3	347	4	354		8	7	6	21		2	163	3	168		46	522	569																								
4:45 PM - 5:00 PM		5	6	5	16		5	385	7	397		9	7	3	19		5	171	1	177		35	574	609																								
5:00 PM - 5:15 PM		3	7	6	16		4	355	11	370		12	4	4	20		6	164	7	177		36	547	583																								
5:15 PM - 5:30 PM		7	7	4	18		6	327	6	339		7	16	0	23		2	185	12	199		41	538	579																								
5:30 PM - 5:45 PM		6	8	5	19		6	318	3	327		5	5	4	14		22	153	2	177		33	504	537																								
5:45 PM - 6:00 PM		3	4	9	16		6	337	5	348		3	5	7	15		0	151	5	156		31	504	535																								
6:00 PM - 6:15 PM		11	11	9	31		5	335	3	343		12	4	5	21		2	140	5	147		52	490	542																								
6:15 PM - 6:30 PM		11	6	8	25		4	337	11	352		6	6	1	13		4	193	1	198		38	550	588																								
6:30 PM - 6:45 PM		4	0	3	7		4	341	5	350		9	9	1	19		3	175	7	185		26	535	561																								
6:45 PM - 7:00 PM		4	6	14	24		7	330	7	344		6	3	3	12		1	142	3	146		36	490	526																								
<b>Total</b>		63	72	91	226		56	4138	73	4267		94	78	41	213		51	2127	63	2241		439	6508	6947																								
<b>PM One Hour Volumes</b>																																																
4:00 PM - 5:00 PM		14	23	33	70	0.70	14	1458	22	1494	0.94	34	26	16	76	0.90	11	824	21	856	0.76	146	2350	2496																								
4:15 PM - 5:15 PM		14	26	26	66	0.66	16	1431	27	1474	0.93	37	22	17	76	0.90	16	716	21	753	0.81	142	2227	2369																								
4:30 PM - 5:30 PM		17	29	29	75	0.75	18	1414	28	1460	0.92	36	34	13	83	0.90	15	683	23	721	0.91	158	2181	2339																								
4:45 PM - 5:45 PM		21	28	20	69	0.91	21	1385	27	1433	0.90	33	32	11	76	0.83	35	673	22	730	0.92	145	2163	2308																								
5:00 PM - 6:00 PM		19	26	24	69	0.91	22	1337	25	1384	0.94	27	30	15	72	0.78	30	653	26	709	0.89	141	2093	2234																								
5:15 PM - 6:15 PM		27	30	27	84	0.68	23	1317	17	1357	0.97	27	30	16	73	0.79	26	629	24	679	0.85	157	2036	2193																								
5:30 PM - 6:30 PM		31	29	31	91	0.73	21	1327	22	1370	0.97	26	20	17	63	0.75	28	637	13	678	0.86	154	2048	2202																								
5:45 PM - 6:45 PM		29	21	29	79	0.64	19	1350	24	1393	0.99	30	24	14	68	0.81	9	659	18	686	0.87	147	2079	2226																								
6:00 PM - 7:00 PM		30	23	34	87	0.70	20	1343	26	1389	0.99	33	22	10	65	0.77	10	650	16	676	0.85	152	2065	2217																								

# Wells + Associates, Inc.

McLean, Virginia

## Turning Movement Count - All Vehicles

Time Period		Southbound Walnut Street					Westbound Cedar Avenue					Northbound Walnut Street					Eastbound Driveway					North & South	East & West	Total
		Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
<b>AM 15 Minute Volumes</b>																								
6:00 AM - 6:15 AM		0	1	2	3		1	0	0	1		0	9	0	9		0	0	0	0		12	1	13
6:15 AM - 6:30 AM		0	3	2	5		1	0	0	1		0	8	0	8		0	0	0	0		13	1	14
6:30 AM - 6:45 AM		0	1	1	2		2	0	1	3		2	14	0	16		0	0	0	0		18	3	21
6:45 AM - 7:00 AM		0	4	1	5		1	0	0	1		4	17	0	21		0	0	0	0		26	1	27
7:00 AM - 7:15 AM		0	6	1	7		1	0	1	2		1	13	0	14		0	0	0	0		21	2	23
7:15 AM - 7:30 AM		0	12	2	14		8	0	0	8		6	18	0	24		0	0	0	0		38	8	46
7:30 AM - 7:45 AM		0	13	2	15		2	0	1	3		9	19	0	28		0	0	0	0		43	3	46
7:45 AM - 8:00 AM		0	17	5	22		7	0	1	8		16	13	0	29		0	0	0	0		51	8	59
8:00 AM - 8:15 AM		0	8	2	10		5	0	1	6		10	18	0	28		0	0	0	0		38	6	44
8:15 AM - 8:30 AM		1	12	9	22		2	0	2	4		8	25	4	37		0	0	1	1		59	5	64
8:30 AM - 8:45 AM		0	9	4	13		5	0	1	6		6	23	2	31		0	0	0	0		44	6	50
8:45 AM - 9:00 AM		0	14	16	30		9	0	3	12		4	28	0	32		0	0	0	0		62	12	74
<b>Total</b>		1	100	47	148		44	0	11	55		66	205	6	277		0	0	1	1		425	56	481
<b>AM One Hour Volumes</b>																								
6:00 AM - 7:00 AM		0	9	6	15	0.75	5	0	1	6	0.50	6	48	0	54	0.64	0	0	0	0	0.00	69	6	75
6:15 AM - 7:15 AM		0	14	5	19	0.68	5	0	2	7	0.58	7	52	0	59	0.70	0	0	0	0	0.00	78	7	85
6:30 AM - 7:30 AM		0	23	5	28	0.50	12	0	2	14	0.44	13	62	0	75	0.78	0	0	0	0	0.00	103	14	117
6:45 AM - 7:45 AM		0	35	6	41	0.68	12	0	2	14	0.44	20	67	0	87	0.78	0	0	0	0	0.00	128	14	142
7:00 AM - 8:00 AM		0	48	10	58	0.66	18	0	3	21	0.66	32	63	0	95	0.82	0	0	0	0	0.00	153	21	174
7:15 AM - 8:15 AM		0	50	11	61	0.69	22	0	3	25	0.78	41	68	0	109	0.94	0	0	0	0	0.00	170	25	195
7:30 AM - 8:30 AM		1	50	18	69	0.78	16	0	5	21	0.66	43	75	4	122	0.82	0	0	1	1	0.25	191	22	213
7:45 AM - 8:45 AM		1	46	20	67	0.76	19	0	5	24	0.75	40	79	6	125	0.84	0	0	1	1	0.25	192	25	217
<b>8:00 AM - 9:00 AM</b>		1	43	31	75	0.63	21	0	7	28	0.58	28	94	6	128	0.86	0	0	1	1	0.25	203	29	232
<b>PM 15 Minute Volumes</b>																								
4:00 PM - 4:15 PM		0	11	1	12		2	0	7	9		1	21	0	22		0	0	0	0		34	9	43
4:15 PM - 4:30 PM		1	16	6	23		5	0	3	8		4	16	0	20		1	0	0	1		43	9	52
4:30 PM - 4:45 PM		1	13	3	17		5	0	8	13		3	16	0	19		1	0	2	3		36	16	52
4:45 PM - 5:00 PM		0	17	5	22		1	0	2	3		2	18	1	21		0	0	1	1		43	4	47
5:00 PM - 5:15 PM		0	22	3	25		3	0	4	7		4	15	0	19		1	0	0	1		44	8	52
5:15 PM - 5:30 PM		0	17	1	18		2	0	5	7		4	10	0	14		0	0	0	0		32	7	39
5:30 PM - 5:45 PM		0	12	4	16		4	0	9	13		3	16	0	19		0	0	0	0		35	13	48
5:45 PM - 6:00 PM		1	12	2	15		8	0	4	12		1	11	1	13		0	0	0	0		28	12	40
6:00 PM - 6:15 PM		0	14	4	18		2	0	5	7		0	18	0	18		3	0	1	4		36	11	47
6:15 PM - 6:30 PM		0	17	6	23		2	1	4	7		2	15	0	17		0	0	1	1		40	8	48
6:30 PM - 6:45 PM		0	13	0	13		2	0	1	3		1	17	0	18		0	0	0	0		31	3	34
6:45 PM - 7:00 PM		0	15	3	18		0	0	5	5		0	10	0	10		0	0	0	0		28	5	33
<b>Total</b>		3	179	38	220		36	1	57	94		25	183	2	210		6	0	5	11		430	105	535
<b>PM One Hour Volumes</b>																								
4:00 PM - 5:00 PM		2	57	15	74	0.80	13	0	20	33	0.63	10	71	1	82	0.93	2	0	3	5	0.42	156	38	194
<b>4:15 PM - 5:15 PM</b>		2	68	17	87	0.87	14	0	17	31	0.60	13	65	1	79	0.94	3	0	3	6	0.50	166	37	203
4:30 PM - 5:30 PM		1	69	12	82	0.82	11	0	19	30	0.58	13	59	1	73	0.87	2	0	3	5	0.42	155	35	190
4:45 PM - 5:45 PM		0	68	13	81	0.81	10	0	20	30	0.58	13	59	1	73	0.87	1	0	1	2	0.50	154	32	186
5:00 PM - 6:00 PM		1	63	10	74	0.74	17	0	22	39	0.75	12	52	1	65	0.86	1	0	0	1	0.25	139	40	179
5:15 PM - 6:15 PM		1	55	11	67	0.93	16	0	23	39	0.75	8	55	1	64	0.84	3	0	1	4	0.25	131	43	174
5:30 PM - 6:30 PM		1	55	16	72	0.78	16	1	22	39	0.75	6	60	1	67	0.88	3	0	2	5	0.31	139	44	183
5:45 PM - 6:45 PM		1	56	12	69	0.75	14	1	14	29	0.60	4	61	1	66	0.92	3	0	2	5	0.31	135	34	169
6:00 PM - 7:00 PM		0	59	13	72	0.78	6	1	15	22	0.79	3	60	0	63	0.88	3	0	2	5	0.31	135	27	162

# Wells + Associates, Inc.

McLean, Virginia

## Turning Movement Count - All Vehicles

Time Period		Southbound Walnut Street					Westbound Second Street					Northbound Walnut Street					Eastbound Second Street					North & South	East & West	Total
		Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
<b>AM 15 Minute Volumes</b>																								
6:00 AM - 6:15 AM		1	1	0	2		1	0	0	1		0	9	0	9		0	0	0	0		11	1	12
6:15 AM - 6:30 AM		0	2	1	3		0	0	0	0		0	10	0	10		1	0	0	1		13	1	14
6:30 AM - 6:45 AM		0	1	0	1		0	1	0	1		0	14	0	14		0	0	0	0		15	1	16
6:45 AM - 7:00 AM		0	3	0	3		0	2	0	2		1	21	0	22		1	0	1	2		25	4	29
7:00 AM - 7:15 AM		0	7	0	7		1	1	0	2		0	20	0	20		0	3	1	4		27	6	33
7:15 AM - 7:30 AM		0	15	0	15		1	0	0	1		0	11	3	14		0	0	3	3		29	4	33
7:30 AM - 7:45 AM		0	10	0	10		0	0	0	0		0	26	0	26		2	3	3	8		36	8	44
7:45 AM - 8:00 AM		0	18	0	18		1	1	0	2		2	23	2	27		3	4	5	12		45	14	59
8:00 AM - 8:15 AM		0	7	1	8		3	0	1	4		0	29	0	29		1	0	3	4		37	8	45
8:15 AM - 8:30 AM		1	11	2	14		0	1	1	2		0	32	0	32		2	3	0	5		46	7	53
8:30 AM - 8:45 AM		1	13	0	14		0	0	0	0		1	25	0	26		3	2	5	10		40	10	50
8:45 AM - 9:00 AM		2	10	0	12		2	0	2	4		0	23	1	24		3	3	5	11		36	15	51
<b>Total</b>		<b>5</b>	<b>98</b>	<b>4</b>	<b>107</b>		<b>9</b>	<b>6</b>	<b>4</b>	<b>19</b>		<b>4</b>	<b>243</b>	<b>6</b>	<b>253</b>		<b>16</b>	<b>18</b>	<b>26</b>	<b>60</b>		<b>360</b>	<b>79</b>	<b>439</b>
<b>AM One Hour Volumes</b>																								
6:00 AM - 7:00 AM		1	7	1	9	0.75	1	3	0	4	0.50	1	54	0	55	0.63	2	0	1	3	0.38	64	7	71
6:15 AM - 7:15 AM		0	13	1	14	0.50	1	4	0	5	0.63	1	65	0	66	0.75	2	3	2	7	0.44	80	12	92
6:30 AM - 7:30 AM		0	26	0	26	0.43	2	4	0	6	0.75	1	66	3	70	0.80	1	3	5	9	0.56	96	15	111
6:45 AM - 7:45 AM		0	35	0	35	0.58	2	3	0	5	0.63	1	78	3	82	0.79	3	6	8	17	0.53	117	22	139
7:00 AM - 8:00 AM		0	50	0	50	0.69	3	2	0	5	0.63	2	80	5	87	0.81	5	10	12	27	0.56	137	32	169
7:15 AM - 8:15 AM		0	50	1	51	0.71	5	1	1	7	0.44	2	89	5	96	0.83	6	7	14	27	0.56	147	34	181
7:30 AM - 8:30 AM		1	46	3	50	0.69	4	2	2	8	0.50	2	110	2	114	0.89	8	10	11	29	0.60	164	37	201
<b>7:45 AM - 8:45 AM</b>		<b>2</b>	<b>49</b>	<b>3</b>	<b>54</b>	<b>0.75</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>8</b>	<b>0.50</b>	<b>3</b>	<b>109</b>	<b>2</b>	<b>114</b>	<b>0.89</b>	<b>9</b>	<b>9</b>	<b>13</b>	<b>31</b>	<b>0.65</b>	<b>168</b>	<b>39</b>	<b>207</b>
8:00 AM - 9:00 AM		4	41	3	48	0.86	5	1	4	10	0.63	1	109	1	111	0.87	9	8	13	30	0.68	159	40	199
<b>PM 15 Minute Volumes</b>																								
4:00 PM - 4:15 PM		1	20	0	21		0	0	1	1		0	22	1	23		1	1	0	2		44	3	47
4:15 PM - 4:30 PM		0	21	1	22		0	0	0	0		0	14	1	15		1	2	4	7		37	7	44
4:30 PM - 4:45 PM		4	17	1	22		0	0	1	1		0	15	0	15		2	1	0	3		37	4	41
4:45 PM - 5:00 PM		1	19	0	20		0	2	0	2		0	19	2	21		1	1	1	3		41	5	46
5:00 PM - 5:15 PM		1	25	1	27		0	0	0	0		1	17	3	21		1	4	0	5		48	5	53
5:15 PM - 5:30 PM		0	22	2	24		1	0	0	1		0	14	0	14		0	5	0	5		38	6	44
5:30 PM - 5:45 PM		0	23	0	23		0	3	0	3		0	16	1	17		1	1	0	2		40	5	45
5:45 PM - 6:00 PM		0	14	0	14		0	1	1	2		1	13	0	14		2	3	0	5		28	7	35
6:00 PM - 6:15 PM		1	18	2	21		0	1	0	1		2	17	0	19		2	4	0	6		40	7	47
6:15 PM - 6:30 PM		1	21	0	22		1	0	0	1		0	13	1	14		0	3	0	3		36	4	40
6:30 PM - 6:45 PM		0	14	0	14		0	0	1	1		0	20	1	21		0	2	0	2		35	3	38
6:45 PM - 7:00 PM		1	19	0	20		0	1	0	1		0	10	0	10		2	0	1	3		30	4	34
<b>Total</b>		<b>10</b>	<b>233</b>	<b>7</b>	<b>250</b>		<b>2</b>	<b>8</b>	<b>4</b>	<b>14</b>		<b>4</b>	<b>190</b>	<b>10</b>	<b>204</b>		<b>13</b>	<b>27</b>	<b>6</b>	<b>46</b>		<b>454</b>	<b>60</b>	<b>514</b>
<b>PM One Hour Volumes</b>																								
4:00 PM - 5:00 PM		6	77	2	85	0.97	0	2	2	4	0.50	0	70	4	74	0.80	5	5	5	15	0.54	159	19	178
4:15 PM - 5:15 PM		6	82	3	91	0.84	0	2	1	3	0.38	1	65	6	72	0.86	5	8	5	18	0.64	163	21	184
4:30 PM - 5:30 PM		6	83	4	93	0.86	1	2	1	4	0.50	1	65	5	71	0.85	4	11	1	16	0.80	164	20	184
<b>4:45 PM - 5:45 PM</b>		<b>2</b>	<b>89</b>	<b>3</b>	<b>94</b>	<b>0.87</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>6</b>	<b>0.50</b>	<b>1</b>	<b>66</b>	<b>6</b>	<b>73</b>	<b>0.87</b>	<b>3</b>	<b>11</b>	<b>1</b>	<b>15</b>	<b>0.75</b>	<b>167</b>	<b>21</b>	<b>188</b>
5:00 PM - 6:00 PM		1	84	3	88	0.81	1	4	1	6	0.50	2	60	4	66	0.79	4	13	0	17	0.85	154	23	177
5:15 PM - 6:15 PM		1	77	4	82	0.85	1	5	1	7	0.58	3	60	1	64	0.84	5	13	0	18	0.75	146	25	171
5:30 PM - 6:30 PM		2	76	2	80	0.87	1	5	1	7	0.58	3	59	2	64	0.84	5	11	0	16	0.67	144	23	167
5:45 PM - 6:45 PM		2	67	2	71	0.81	1	2	2	5	0.63	3	63	2	68	0.81	4	12	0	16	0.67	139	21	160
6:00 PM - 7:00 PM		3	72	2	77	0.88	1	2	1	4	1.00	2	60	2	64	0.76	4	9	1	14	0.58	141	18	159

# Wells + Associates, Inc.

McLean, Virginia

## Turning Movement Count - All Vehicles

PROJECT: Pulte Homes Breezeway - City of Fairfax		DATE: 7/11/2019		SOUTHBOUND ROAD: Oak Street																			
W+A JOB NO: 7476		DAY: Thursday		NORTHBOUND ROAD: Oak Street																			
INTERSECTION: Oak Street & Second Street		WEATHER: clear		WESTBOUND ROAD: N/A																			
LOCATION: City of Fairfax, VA		COUNTED BY: Maria		EASTBOUND ROAD: Second Street																			
		INPUTED BY: Dyrón																					
Time Period	Southbound Oak Street					Westbound N/A					Northbound Oak Street					Eastbound Second Street					North & South	East & West	Total
	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
<b>AM 15 Minute Volumes</b>																							
6:00 AM - 6:15 AM	0	8	0	8		0	0	0	0		0	9	0	9		0	0	0	0		17	0	17
6:15 AM - 6:30 AM	0	5	0	5		0	0	0	0		0	8	0	8		1	0	0	1		13	1	14
6:30 AM - 6:45 AM	0	3	0	3		0	0	0	0		0	13	0	13		0	0	0	0		16	0	16
6:45 AM - 7:00 AM	1	4	0	5		0	0	0	0		0	14	0	14		2	0	0	2		19	2	21
7:00 AM - 7:15 AM	0	5	0	5		0	0	0	0		0	19	0	19		1	0	1	2		24	2	26
7:15 AM - 7:30 AM	0	11	0	11		0	0	0	0		0	15	0	15		0	0	0	0		26	0	26
7:30 AM - 7:45 AM	1	14	0	15		0	0	0	0		0	19	0	19		3	0	0	3		34	3	37
7:45 AM - 8:00 AM	0	20	0	20		0	0	0	0		0	19	0	19		4	0	2	6		39	6	45
8:00 AM - 8:15 AM	2	23	0	25		0	0	0	0		0	23	1	24		0	0	0	0		49	0	49
8:15 AM - 8:30 AM	1	36	0	37		0	0	0	0		0	23	0	23		5	0	0	5		60	5	65
8:30 AM - 8:45 AM	0	20	0	20		0	0	0	0		0	27	0	27		2	0	0	2		47	2	49
8:45 AM - 9:00 AM	0	33	0	33		0	0	0	0		0	28	1	29		0	0	1	1		62	1	63
<b>Total</b>	<b>5</b>	<b>182</b>	<b>0</b>	<b>187</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>217</b>	<b>2</b>	<b>219</b>		<b>18</b>	<b>0</b>	<b>4</b>	<b>22</b>		<b>406</b>	<b>22</b>	<b>428</b>
<b>AM One Hour Volumes</b>																							
6:00 AM - 7:00 AM	1	20	0	21	0.66	0	0	0	0	0.00	0	44	0	44	0.79	3	0	0	3	0.38	65	3	68
6:15 AM - 7:15 AM	1	17	0	18	0.90	0	0	0	0	0.00	0	54	0	54	0.71	4	0	1	5	0.63	72	5	77
6:30 AM - 7:30 AM	1	23	0	24	0.55	0	0	0	0	0.00	0	61	0	61	0.80	3	0	1	4	0.50	85	4	89
6:45 AM - 7:45 AM	2	34	0	36	0.60	0	0	0	0	0.00	0	67	0	67	0.88	6	0	1	7	0.58	103	7	110
7:00 AM - 8:00 AM	1	50	0	51	0.64	0	0	0	0	0.00	0	72	0	72	0.95	8	0	3	11	0.46	123	11	134
7:15 AM - 8:15 AM	3	68	0	71	0.71	0	0	0	0	0.00	0	76	1	77	0.80	7	0	2	9	0.38	148	9	157
7:30 AM - 8:30 AM	4	93	0	97	0.66	0	0	0	0	0.00	0	84	1	85	0.89	12	0	2	14	0.58	182	14	196
7:45 AM - 8:45 AM	3	99	0	102	0.69	0	0	0	0	0.00	0	92	1	93	0.86	11	0	2	13	0.54	195	13	208
<b>8:00 AM - 9:00 AM</b>	<b>3</b>	<b>112</b>	<b>0</b>	<b>115</b>	<b>0.78</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>101</b>	<b>2</b>	<b>103</b>	<b>0.89</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>0.40</b>	<b>218</b>	<b>8</b>	<b>226</b>
<b>PM 15 Minute Volumes</b>																							
4:00 PM - 4:15 PM	1	16	0	17		0	0	0	0		0	21	1	22		0	0	0	0		39	0	39
4:15 PM - 4:30 PM	0	16	0	16		0	0	0	0		0	20	0	20		1	0	0	1		36	1	37
4:30 PM - 4:45 PM	1	25	0	26		0	0	0	0		0	25	0	25		1	0	0	1		51	1	52
4:45 PM - 5:00 PM	0	31	0	31		0	0	0	0		0	17	3	20		1	0	1	2		51	2	53
5:00 PM - 5:15 PM	0	21	0	21		0	0	0	0		0	23	0	23		4	0	1	5		44	5	49
5:15 PM - 5:30 PM	1	22	0	23		0	0	0	0		0	30	1	31		4	0	1	5		54	5	59
5:30 PM - 5:45 PM	2	25	0	27		0	0	0	0		0	17	1	18		0	0	0	0		45	0	45
5:45 PM - 6:00 PM	3	15	0	18		0	0	0	0		0	30	1	31		3	0	0	3		49	3	52
6:00 PM - 6:15 PM	4	16	0	20		0	0	0	0		0	15	0	15		4	0	2	6		35	6	41
6:15 PM - 6:30 PM	0	26	0	26		0	0	0	0		0	7	1	8		2	0	1	3		34	3	37
6:30 PM - 6:45 PM	0	17	0	17		0	0	0	0		0	14	0	14		1	0	0	1		31	1	32
6:45 PM - 7:00 PM	0	18	0	18		0	0	0	0		0	14	1	15		2	0	1	3		33	3	36
<b>Total</b>	<b>12</b>	<b>248</b>	<b>0</b>	<b>260</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>233</b>	<b>9</b>	<b>242</b>		<b>23</b>	<b>0</b>	<b>7</b>	<b>30</b>		<b>502</b>	<b>30</b>	<b>532</b>
<b>PM One Hour Volumes</b>																							
4:00 PM - 5:00 PM	2	88	0	90	0.73	0	0	0	0	0.00	0	83	4	87	0.87	3	0	1	4	0.50	177	4	181
4:15 PM - 5:15 PM	1	93	0	94	0.76	0	0	0	0	0.00	0	85	3	88	0.88	7	0	2	9	0.45	182	9	191
<b>4:30 PM - 5:30 PM</b>	<b>2</b>	<b>99</b>	<b>0</b>	<b>101</b>	<b>0.81</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>95</b>	<b>4</b>	<b>99</b>	<b>0.80</b>	<b>10</b>	<b>0</b>	<b>3</b>	<b>13</b>	<b>0.65</b>	<b>200</b>	<b>13</b>	<b>213</b>
4:45 PM - 5:45 PM	3	99	0	102	0.82	0	0	0	0	0.00	0	87	5	92	0.74	9	0	3	12	0.60	194	12	206
5:00 PM - 6:00 PM	6	83	0	89	0.82	0	0	0	0	0.00	0	100	3	103	0.83	11	0	2	13	0.65	192	13	205
5:15 PM - 6:15 PM	10	78	0	88	0.81	0	0	0	0	0.00	0	92	3	95	0.77	11	0	3	14	0.58	183	14	197
5:30 PM - 6:30 PM	9	82	0	91	0.84	0	0	0	0	0.00	0	69	3	72	0.58	9	0	3	12	0.50	163	12	175
5:45 PM - 6:45 PM	7	74	0	81	0.78	0	0	0	0	0.00	0	66	2	68	0.55	10	0	3	13	0.54	149	13	162
6:00 PM - 7:00 PM	4	77	0	81	0.78	0	0	0	0	0.00	0	50	2	52	0.87	9	0	4	13	0.54	133	13	146



# Wells + Associates, Inc.

McLean, Virginia

## Turning Movement Count - All Vehicles

Time Period		Southbound Oak Street					Westbound Panther Place					Northbound Oak Street					Eastbound Cedar Avenue					North & South	East & West	Total
		Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
<b>AM 15 Minute Volumes</b>																								
6:00 AM - 6:15 AM		2	9	1	12		0	1	0	1		0	8	0	8		1	1	1	3		20	4	24
6:15 AM - 6:30 AM		0	5	2	7		0	0	0	0		0	8	1	9		1	1	0	2		16	2	18
6:30 AM - 6:45 AM		1	3	0	4		0	0	0	0		1	12	0	13		0	1	2	3		17	3	20
6:45 AM - 7:00 AM		0	6	1	7		0	0	0	0		1	12	1	14		0	2	4	6		21	6	27
7:00 AM - 7:15 AM		2	6	1	9		1	1	1	3		3	16	0	19		1	0	2	3		28	6	34
7:15 AM - 7:30 AM		2	10	0	12		1	0	0	1		2	14	1	17		2	0	5	7		29	8	37
7:30 AM - 7:45 AM		0	13	1	14		1	0	0	1		4	13	0	17		1	5	7	13		31	14	45
7:45 AM - 8:00 AM		2	21	6	29		1	2	2	5		4	15	1	20		1	12	5	18		49	23	72
8:00 AM - 8:15 AM		0	19	5	24		6	2	7	15		8	22	0	30		0	7	7	14		54	29	83
8:15 AM - 8:30 AM		2	26	1	29		8	1	5	14		7	16	0	23		2	4	6	12		52	26	78
8:30 AM - 8:45 AM		1	14	11	26		5	2	6	13		5	22	1	28		4	4	5	13		54	26	80
8:45 AM - 9:00 AM		1	22	16	39		17	3	13	33		9	22	0	31		3	14	2	19		70	52	122
<b>Total</b>		<b>13</b>	<b>154</b>	<b>45</b>	<b>212</b>		<b>40</b>	<b>12</b>	<b>34</b>	<b>86</b>		<b>44</b>	<b>180</b>	<b>5</b>	<b>229</b>		<b>16</b>	<b>51</b>	<b>46</b>	<b>113</b>		<b>441</b>	<b>199</b>	<b>640</b>
<b>AM One Hour Volumes</b>																								
6:00 AM - 7:00 AM		3	23	4	30	0.63	0	1	0	1	0.25	2	40	2	44	0.79	2	5	7	14	0.58	74	15	89
6:15 AM - 7:15 AM		3	20	4	27	0.75	1	1	1	3	0.25	5	48	2	55	0.72	2	4	8	14	0.58	82	17	99
6:30 AM - 7:30 AM		5	25	2	32	0.67	2	1	1	4	0.33	7	54	2	63	0.83	3	3	13	19	0.68	95	23	118
6:45 AM - 7:45 AM		4	35	3	42	0.75	3	1	1	5	0.42	10	55	2	67	0.88	4	7	18	29	0.56	109	34	143
7:00 AM - 8:00 AM		6	50	8	64	0.55	4	3	3	10	0.50	13	58	2	73	0.91	5	17	19	41	0.57	137	51	188
7:15 AM - 8:15 AM		4	63	12	79	0.68	9	4	9	22	0.37	18	64	2	84	0.70	4	24	24	52	0.72	163	74	237
7:30 AM - 8:30 AM		4	79	13	96	0.83	16	5	14	35	0.58	23	66	1	90	0.75	4	28	25	57	0.79	186	92	278
7:45 AM - 8:45 AM		5	80	23	108	0.93	20	7	20	47	0.78	24	75	2	101	0.84	7	27	23	57	0.79	209	104	313
<b>8:00 AM - 9:00 AM</b>		<b>4</b>	<b>81</b>	<b>33</b>	<b>118</b>	<b>0.76</b>	<b>36</b>	<b>8</b>	<b>31</b>	<b>75</b>	<b>0.57</b>	<b>29</b>	<b>82</b>	<b>1</b>	<b>112</b>	<b>0.90</b>	<b>9</b>	<b>29</b>	<b>20</b>	<b>58</b>	<b>0.76</b>	<b>230</b>	<b>133</b>	<b>363</b>
<b>PM 15 Minute Volumes</b>																								
4:00 PM - 4:15 PM		7	20	3	30		1	2	1	4		4	20	1	25		0	0	1	1		55	5	60
4:15 PM - 4:30 PM		5	20	0	25		4	4	2	10		1	17	0	18		4	4	3	11		43	21	64
4:30 PM - 4:45 PM		8	25	3	36		3	3	3	9		1	27	2	30		3	1	2	6		66	15	81
4:45 PM - 5:00 PM		2	30	0	32		1	1	0	2		1	18	1	20		3	0	4	7		52	9	61
5:00 PM - 5:15 PM		5	23	1	29		1	0	2	3		1	24	2	27		2	1	3	6		56	9	65
5:15 PM - 5:30 PM		4	20	1	25		1	1	3	5		1	30	1	32		2	1	3	5		57	10	67
5:30 PM - 5:45 PM		8	28	0	36		0	1	1	2		0	18	1	19		1	1	2	5		55	7	62
5:45 PM - 6:00 PM		4	19	2	25		1	2	1	4		0	32	3	35		1	1	1	3		60	7	67
6:00 PM - 6:15 PM		3	20	1	24		0	0	2	2		0	19	2	21		3	0	0	3		45	5	50
6:15 PM - 6:30 PM		4	19	1	24		0	1	1	2		0	8	0	8		3	0	2	5		32	7	39
6:30 PM - 6:45 PM		2	22	0	24		0	0	0	0		0	15	1	16		0	0	1	1		40	1	41
6:45 PM - 7:00 PM		5	20	0	25		0	0	0	0		0	11	0	11		1	0	0	1		36	1	37
<b>Total</b>		<b>57</b>	<b>266</b>	<b>12</b>	<b>335</b>		<b>12</b>	<b>15</b>	<b>16</b>	<b>43</b>		<b>9</b>	<b>239</b>	<b>14</b>	<b>262</b>		<b>23</b>	<b>9</b>	<b>22</b>	<b>54</b>		<b>597</b>	<b>97</b>	<b>694</b>
<b>PM One Hour Volumes</b>																								
4:00 PM - 5:00 PM		22	95	6	123	0.85	9	10	6	25	0.63	7	82	4	93	0.78	10	5	10	25	0.57	216	50	266
4:15 PM - 5:15 PM		20	98	4	122	0.85	9	8	7	24	0.60	4	86	5	95	0.79	12	6	12	30	0.68	217	54	271
<b>4:30 PM - 5:30 PM</b>		<b>19</b>	<b>98</b>	<b>5</b>	<b>122</b>	<b>0.85</b>	<b>6</b>	<b>5</b>	<b>8</b>	<b>19</b>	<b>0.53</b>	<b>4</b>	<b>99</b>	<b>6</b>	<b>109</b>	<b>0.85</b>	<b>9</b>	<b>3</b>	<b>12</b>	<b>24</b>	<b>0.86</b>	<b>231</b>	<b>43</b>	<b>274</b>
4:45 PM - 5:45 PM		19	101	2	122	0.85	3	3	6	12	0.60	3	90	5	98	0.77	8	3	12	23	0.82	220	35	255
5:00 PM - 6:00 PM		21	90	4	115	0.80	3	4	7	14	0.70	2	104	7	113	0.81	6	4	9	19	0.79	228	33	261
5:15 PM - 6:15 PM		19	87	4	110	0.76	2	4	7	13	0.65	1	99	7	107	0.76	7	3	6	16	0.80	217	29	246
5:30 PM - 6:30 PM		19	86	4	109	0.76	1	4	5	10	0.63	0	77	6	83	0.59	9	2	5	16	0.80	192	26	218
5:45 PM - 6:45 PM		13	80	4	97	0.97	1	3	4	8	0.50	0	74	6	80	0.57	7	1	4	12	0.60	177	20	197
6:00 PM - 7:00 PM		14	81	2	97	0.97	0	1	3	4	0.50	0	53	3	56	0.67	7	0	3	10	0.50	153	14	167

## APPENDIX C

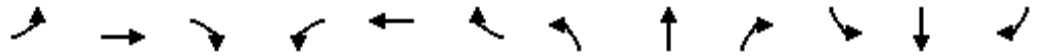
### Existing Capacity Analysis Worksheets

Appendix C: Existing Conditions Capacity Analyses

HCM Signalized Intersection Capacity Analysis

1: Oak Street/Meredith Drive & Fairfax Boulevard

10/22/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1692	18	67	588	3	38	12	79	9	1	18
Future Volume (vph)	21	1692	18	67	588	3	38	12	79	9	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	4.6		5.6	4.6			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1597	3500		1805	3404			1830	1615		1708	
Flt Permitted	0.37	1.00		0.03	1.00			0.96	1.00		0.98	
Satd. Flow (perm)	621	3500		66	3404			1830	1615		1708	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	25	1991	21	79	692	4	45	14	93	11	1	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	86	0	20	0
Lane Group Flow (vph)	25	2012	0	79	696	0	0	59	7	0	13	0
Heavy Vehicles (%)	13%	3%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		4	4		7	7	
Permitted Phases	2			6					4			
Actuated Green, G (s)	132.5	126.7		140.9	130.9			11.6	11.6		6.5	
Effective Green, g (s)	134.5	128.7		142.9	132.9			13.6	13.6		8.5	
Actuated g/C Ratio	0.71	0.68		0.75	0.70			0.07	0.07		0.04	
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5	6.5		6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	474	2370		150	2381			130	115		76	
v/s Ratio Prot	0.00	c0.57		c0.03	0.20			c0.03			c0.01	
v/s Ratio Perm	0.04			0.36					0.00			
v/c Ratio	0.05	0.85		0.53	0.29			0.45	0.06		0.17	
Uniform Delay, d1	8.3	23.3		44.6	10.8			84.6	82.2		87.4	
Progression Factor	0.83	0.64		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	3.0		3.3	0.3			2.5	0.2		1.1	
Delay (s)	6.9	17.9		47.9	11.1			87.1	82.4		88.4	
Level of Service	A	B		D	B			F	F		F	
Approach Delay (s)		17.8			14.9			84.3			88.4	
Approach LOS		B			B			F			F	

Intersection Summary		
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.74	C
Actuated Cycle Length (s)	190.0	Sum of lost time (s)
Intersection Capacity Utilization	71.6%	ICU Level of Service
Analysis Period (min)	15	C
c Critical Lane Group		

Appendix C: Existing Conditions Capacity Analyses

HCM Signalized Intersection Capacity Analysis

2: Walnut Street/Fairchester Drive & Fairfax Boulevard

10/22/2020



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1661	17	20	606	18	13	26	45	25	25	12
Future Volume (vph)	10	1661	17	20	606	18	13	26	45	25	25	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	3501		1805	3397		1805	1572		1752	1771	
Flt Permitted	0.36	1.00		0.07	1.00		0.73	1.00		0.47	1.00	
Satd. Flow (perm)	636	3501		127	3397		1385	1572		871	1771	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	12	1954	20	24	713	21	15	31	53	29	29	14
RTOR Reduction (vph)	0	0	0	0	1	0	0	40	0	0	10	0
Lane Group Flow (vph)	12	1974	0	24	733	0	15	44	0	29	33	0
Heavy Vehicles (%)	8%	3%	0%	0%	6%	0%	0%	5%	12%	3%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			7				3
Permitted Phases	2			6			7			3		
Actuated Green, G (s)	148.5	145.7		151.3	147.1		20.4	20.4		9.3	9.3	
Effective Green, g (s)	150.5	146.7		153.3	148.1		22.4	22.4		11.3	11.3	
Actuated g/C Ratio	0.79	0.77		0.81	0.78		0.12	0.12		0.06	0.06	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	524	2703		148	2647		163	185		51	105	
v/s Ratio Prot	0.00	c0.56		c0.00	0.22			c0.03			0.02	
v/s Ratio Perm	0.02			0.13			0.01			c0.03		
v/c Ratio	0.02	0.73		0.16	0.28		0.09	0.24		0.57	0.31	
Uniform Delay, d1	4.2	11.3		12.6	5.9		74.7	76.1		87.0	85.6	
Progression Factor	1.00	1.00		0.98	0.42		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.8		0.5	0.3		0.2	0.7		13.7	1.7	
Delay (s)	4.2	13.1		12.9	2.7		75.0	76.7		100.7	87.3	
Level of Service	A	B		B	A		E	E		F	F	
Approach Delay (s)		13.0			3.0			76.5			92.7	
Approach LOS		B			A			E			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			190.0				Sum of lost time (s)		20.7			
Intersection Capacity Utilization			62.9%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

Appendix C: Existing Conditions Capacity Analyses

HCM Unsignalized Intersection Capacity Analysis

3: Walnut Street & Cedar Avenue

















10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	7	0	21	6	94	28	31	43	1
Future Volume (Veh/h)	0	0	0	7	0	21	6	94	28	31	43	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	8	0	25	7	111	33	36	51	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												366
pX, platoon unblocked												
vC, conflicting volume	290	282	52	265	266	128	52				144	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	290	282	52	265	266	128	52				144	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	99	100	97	100				97	
cM capacity (veh/h)	630	609	1016	672	621	923	1554				1438	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	33	151	88								
Volume Left	0	8	7	36								
Volume Right	0	25	33	1								
cSH	1700	846	1554	1438								
Volume to Capacity	0.00	0.04	0.00	0.03								
Queue Length 95th (ft)	0	3	0	2								
Control Delay (s)	0.0	9.4	0.4	3.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.0	9.4	0.4	3.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay				2.4								
Intersection Capacity Utilization				24.4%	ICU Level of Service							A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

4: Walnut Street & Second Street

10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	9	9	2	2	4	2	109	3	3	49	2
Future Volume (vph)	13	9	9	2	2	4	2	109	3	3	49	2
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	15	11	11	2	2	5	2	128	4	4	58	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	37	9	134	64								
Volume Left (vph)	15	2	2	4								
Volume Right (vph)	11	5	4	2								
Hadj (s)	-0.06	-0.25	0.02	0.03								
Departure Headway (s)	4.3	4.1	4.1	4.2								
Degree Utilization, x	0.04	0.01	0.15	0.07								
Capacity (veh/h)	801	828	860	847								
Control Delay (s)	7.5	7.2	7.8	7.5								
Approach Delay (s)	7.5	7.2	7.8	7.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.7									
Level of Service			A									
Intersection Capacity Utilization			16.5%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

5: Oak Street & Second Street

10/22/2020



















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	1	7	2	101	112	3
Future Volume (vph)	1	7	2	101	112	3
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	8	2	119	132	4
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	9	121	136			
Volume Left (vph)	1	2	0			
Volume Right (vph)	8	0	4			
Hadj (s)	-0.48	0.04	0.02			
Departure Headway (s)	4.0	4.1	4.0			
Degree Utilization, x	0.01	0.14	0.15			
Capacity (veh/h)	848	864	879			
Control Delay (s)	7.0	7.7	7.8			
Approach Delay (s)	7.0	7.7	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			16.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Appendix C: Existing Conditions Capacity Analyses

HCM Unsignalized Intersection Capacity Analysis

6: Oak Street & Cedar Avenue

10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	29	9	31	8	36	1	82	29	33	81	4
Future Volume (vph)	20	29	9	31	8	36	1	82	29	33	81	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	34	11	36	9	42	1	96	34	39	95	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	69	87	131	139								
Volume Left (vph)	24	36	1	39								
Volume Right (vph)	11	42	34	5								
Hadj (s)	0.01	-0.17	-0.12	0.07								
Departure Headway (s)	4.6	4.4	4.3	4.5								
Degree Utilization, x	0.09	0.11	0.16	0.17								
Capacity (veh/h)	719	753	796	762								
Control Delay (s)	8.1	8.0	8.1	8.4								
Approach Delay (s)	8.1	8.0	8.1	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.2									
Level of Service			A									
Intersection Capacity Utilization			25.8%	ICU Level of Service	A							
Analysis Period (min)			15									



Appendix C: Existing Conditions Capacity Analyses

HCM Signalized Intersection Capacity Analysis

1: Oak Street/Meredith Drive & Fairfax Boulevard

10/22/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1031	22	76	1455	0	21	4	88	15	9	18
Future Volume (vph)	32	1031	22	76	1455	0	21	4	88	15	9	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	4.6		5.6	4.6			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1597	3496		1805	3406			1824	1615		1761	
Flt Permitted	0.09	1.00		0.18	1.00			0.96	1.00		0.98	
Satd. Flow (perm)	156	3496		342	3406			1824	1615		1761	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	38	1213	26	89	1712	0	25	5	104	18	11	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	99	0	12	0
Lane Group Flow (vph)	38	1239	0	89	1712	0	0	30	5	0	38	0
Heavy Vehicles (%)	13%	3%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		4	4		7	7	
Permitted Phases	2			6					4			
Actuated Green, G (s)	162.9	156.7		166.9	158.7			9.4	9.4		10.5	
Effective Green, g (s)	164.9	158.7		168.9	160.7			11.4	11.4		12.5	
Actuated g/C Ratio	0.75	0.72		0.77	0.73			0.05	0.05		0.06	
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5	6.5		6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	164	2521		323	2487			94	83		100	
v/s Ratio Prot	0.01	0.35		c0.01	c0.50			c0.02			c0.02	
v/s Ratio Perm	0.17			0.20					0.00			
v/c Ratio	0.23	0.49		0.28	0.69			0.32	0.06		0.38	
Uniform Delay, d1	14.6	13.2		9.2	16.1			100.6	99.2		100.0	
Progression Factor	0.81	0.61		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.7	0.6		0.5	1.6			2.0	0.3		2.4	
Delay (s)	12.5	8.7		9.7	17.7			102.5	99.6		102.4	
Level of Service	B	A		A	B			F	F		F	
Approach Delay (s)		8.8			17.3			100.2			102.4	
Approach LOS		A			B			F			F	

Intersection Summary

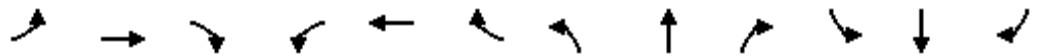
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Appendix C: Existing Conditions Capacity Analyses

HCM Signalized Intersection Capacity Analysis

2: Walnut Street/Fairchester Drive & Fairfax Boulevard

10/22/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	21	1018	11	22	1458	14	16	26	34	33	23	14
Future Volume (vph)	21	1018	11	22	1458	14	16	26	34	33	23	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	3500		1805	3403		1805	1597		1752	1761	
Flt Permitted	0.10	1.00		0.21	1.00		0.71	1.00		0.54	1.00	
Satd. Flow (perm)	183	3500		390	3403		1355	1597		995	1761	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	25	1198	13	26	1715	16	19	31	40	39	27	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	25	0	0	10	0
Lane Group Flow (vph)	25	1211	0	26	1731	0	19	46	0	39	33	0
Heavy Vehicles (%)	8%	3%	0%	0%	6%	0%	0%	5%	12%	3%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			7			3	
Permitted Phases	2			6			7			3		
Actuated Green, G (s)	178.2	172.5		178.2	172.5		22.1	22.1		12.7	12.7	
Effective Green, g (s)	180.2	173.5		180.2	173.5		24.1	24.1		14.7	14.7	
Actuated g/C Ratio	0.82	0.79		0.82	0.79		0.11	0.11		0.07	0.07	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	195	2760		362	2683		148	174		66	117	
v/s Ratio Prot	c0.00	0.35		0.00	c0.51			c0.03			0.02	
v/s Ratio Perm	0.10			0.06			0.01			c0.04		
v/c Ratio	0.13	0.44		0.07	0.65		0.13	0.26		0.59	0.28	
Uniform Delay, d1	8.1	7.5		4.6	10.0		88.5	89.8		99.7	97.6	
Progression Factor	1.00	1.00		0.15	0.07		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.5		0.1	0.9		0.4	0.8		13.4	1.3	
Delay (s)	8.4	8.0		0.7	1.6		88.9	90.6		113.1	98.9	
Level of Service	A	A		A	A		F	F		F	F	
Approach Delay (s)		8.0			1.6			90.3			105.7	
Approach LOS		A			A			F			F	

















Intersection Summary		
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.62	A
Actuated Cycle Length (s)	220.0	Sum of lost time (s)
Intersection Capacity Utilization	57.7%	20.7
Analysis Period (min)	15	ICU Level of Service
		B
c Critical Lane Group		

Appendix C: Existing Conditions Capacity Analyses

HCM Unsignalized Intersection Capacity Analysis

3: Walnut Street & Cedar Avenue

















10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	3	17	0	14	1	65	13	17	68	2
Future Volume (Veh/h)	3	0	3	17	0	14	1	65	13	17	68	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	4	0	4	20	0	16	1	76	15	20	80	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											366	
pX, platoon unblocked												
vC, conflicting volume	222	214	81	210	208	84	82			91		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222	214	81	210	208	84	82			91		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	97	100	98	100			99		
cM capacity (veh/h)	714	674	979	736	680	976	1515			1504		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	36	92	102								
Volume Left	4	20	1	20								
Volume Right	4	16	15	2								
cSH	825	826	1515	1504								
Volume to Capacity	0.01	0.04	0.00	0.01								
Queue Length 95th (ft)	1	3	0	1								
Control Delay (s)	9.4	9.6	0.1	1.5								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.4	9.6	0.1	1.5								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			21.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Walnut Street & Second Street

10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	11	3	0	5	1	6	66	1	3	89	2
Future Volume (vph)	1	11	3	0	5	1	6	66	1	3	89	2
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	13	4	0	6	1	7	78	1	4	105	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	18	7	86	111								
Volume Left (vph)	1	0	7	4								
Volume Right (vph)	4	1	1	2								
Hadj (s)	-0.09	-0.05	0.04	0.03								
Departure Headway (s)	4.2	4.3	4.1	4.1								
Degree Utilization, x	0.02	0.01	0.10	0.13								
Capacity (veh/h)	806	797	857	872								
Control Delay (s)	7.3	7.3	7.5	7.7								
Approach Delay (s)	7.3	7.3	7.5	7.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			16.2%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

5: Oak Street & Second Street

10/22/2020



















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	3	10	4	95	99	2
Future Volume (vph)	3	10	4	95	99	2
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	4	12	5	112	116	2
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	16	117	118			
Volume Left (vph)	4	5	0			
Volume Right (vph)	12	0	2			
Hadj (s)	-0.37	0.04	0.02			
Departure Headway (s)	4.0	4.1	4.1			
Degree Utilization, x	0.02	0.13	0.13			
Capacity (veh/h)	839	862	873			
Control Delay (s)	7.1	7.7	7.7			
Approach Delay (s)	7.1	7.7	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			18.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Appendix C: Existing Conditions Capacity Analyses

HCM Unsignalized Intersection Capacity Analysis

6: Oak Street & Cedar Avenue

10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	3	9	6	5	8	6	99	4	5	98	19
Future Volume (vph)	12	3	9	6	5	8	6	99	4	5	98	19
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	14	4	11	7	6	9	7	116	5	6	115	22
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	29	22	128	143								
Volume Left (vph)	14	7	7	6								
Volume Right (vph)	11	9	5	22								
Hadj (s)	-0.10	-0.15	0.02	-0.05								
Departure Headway (s)	4.4	4.4	4.2	4.1								
Degree Utilization, x	0.04	0.03	0.15	0.16								
Capacity (veh/h)	754	761	838	861								
Control Delay (s)	7.6	7.5	7.9	7.9								
Approach Delay (s)	7.6	7.5	7.9	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.8									
Level of Service			A									
Intersection Capacity Utilization			17.9%	ICU Level of Service	A							
Analysis Period (min)			15									

## APPENDIX D





















# 2024 Background Future Capacity Analysis Worksheets

Appendix D: Background Conditions Capacity Analyses

HCM Signalized Intersection Capacity Analysis

1: Oak Street/Meredith Drive & Fairfax Boulevard

10/22/2020





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1826	20	69	674	3	41	12	81	9	1	19
Future Volume (vph)	22	1826	20	69	674	3	41	12	81	9	1	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	4.6		5.6	4.6			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1597	3500		1805	3404			1829	1615		1705	
Flt Permitted	0.36	1.00		0.04	1.00			0.96	1.00		0.98	
Satd. Flow (perm)	599	3500		68	3404			1829	1615		1705	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	1985	22	75	733	3	45	13	88	10	1	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	82	0	20	0
Lane Group Flow (vph)	24	2007	0	75	736	0	0	58	6	0	12	0
Heavy Vehicles (%)	13%	3%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		4	4		7	7	
Permitted Phases	2			6					4			
Actuated Green, G (s)	131.6	127.2		142.0	132.4			11.5	11.5		6.5	
Effective Green, g (s)	133.6	129.2		144.0	134.4			13.5	13.5		8.5	
Actuated g/C Ratio	0.70	0.68		0.76	0.71			0.07	0.07		0.04	
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5	6.5		6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	449	2380		148	2407			129	114		76	
v/s Ratio Prot	0.00	c0.57		c0.03	0.22			c0.03			c0.01	
v/s Ratio Perm	0.04			0.35					0.00			
v/c Ratio	0.05	0.84		0.51	0.31			0.45	0.05		0.16	
Uniform Delay, d1	8.6	22.8		40.9	10.4			84.7	82.3		87.3	
Progression Factor	0.82	0.63		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	2.9		2.7	0.3			2.5	0.2		1.0	
Delay (s)	7.1	17.3		43.6	10.7			87.2	82.5		88.3	
Level of Service	A	B		D	B			F	F		F	
Approach Delay (s)		17.2			13.8			84.4			88.3	
Approach LOS		B			B			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			190.0			Sum of lost time (s)			24.2			
Intersection Capacity Utilization			74.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												



Appendix D: Background Conditions Capacity Analyses

HCM Signalized Intersection Capacity Analysis  
2: Walnut Street/Fairchester Drive & Fairfax Boulevard

10/22/2020

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1795	19	21	694	19	15	27	46	26	26	12
Future Volume (vph)	10	1795	19	21	694	19	15	27	46	26	26	12
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	3500		1805	3397		1805	1571		1752	1773	
Flt Permitted	0.35	1.00		0.07	1.00		0.73	1.00		0.50	1.00	
Satd. Flow (perm)	608	3500		129	3397		1388	1571		918	1773	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1951	21	23	754	21	16	29	50	28	28	13
RTOR Reduction (vph)	0	0	0	0	0	0	0	40	0	0	9	0
Lane Group Flow (vph)	11	1972	0	23	775	0	16	39	0	28	32	0
Heavy Vehicles (%)	8%	3%	0%	0%	6%	0%	0%	5%	12%	3%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			7			3	
Permitted Phases	2			6			7			3		
Actuated Green, G (s)	148.9	146.1		151.7	147.5		20.0	20.0		8.9	8.9	
Effective Green, g (s)	150.9	147.1		153.7	148.5		22.0	22.0		10.9	10.9	
Actuated g/C Ratio	0.79	0.77		0.81	0.78		0.12	0.12		0.06	0.06	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	504	2709		150	2655		160	181		52	101	
v/s Ratio Prot	0.00	c0.56		c0.00	0.23			c0.02			0.02	
v/s Ratio Perm	0.02			0.12			0.01			c0.03		
v/c Ratio	0.02	0.73		0.15	0.29		0.10	0.22		0.54	0.31	
Uniform Delay, d1	4.1	11.1		12.2	5.9		75.1	76.2		87.1	86.0	
Progression Factor	1.00	1.00		0.86	0.40		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.8		0.5	0.3		0.3	0.6		10.3	1.8	
Delay (s)	4.1	12.8		11.0	2.6		75.4	76.8		97.4	87.7	
Level of Service	A	B		B	A		E	E		F	F	
Approach Delay (s)		12.8			2.8			76.6			91.7	
Approach LOS		B			A			E			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			190.0			Sum of lost time (s)			20.7			
Intersection Capacity Utilization			66.7%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Appendix D: Background Conditions Capacity Analyses

HCM Unsignalized Intersection Capacity Analysis

3: Walnut Street & Cedar Avenue

















10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	0	8	0	24	6	97	29	33	44	1
Future Volume (Veh/h)	1	0	0	8	0	24	6	97	29	33	44	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	0	9	0	26	7	105	32	36	48	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											366	
pX, platoon unblocked												
vC, conflicting volume	282	272	48	256	256	121	49			137		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	282	272	48	256	256	121	49			137		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	97	100			98		
cM capacity (veh/h)	637	617	1020	682	629	930	1558			1447		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1	35	144	85								
Volume Left	1	9	7	36								
Volume Right	0	26	32	1								
cSH	637	851	1558	1447								
Volume to Capacity	0.00	0.04	0.00	0.02								
Queue Length 95th (ft)	0	3	0	2								
Control Delay (s)	10.7	9.4	0.4	3.3								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.7	9.4	0.4	3.3								
Approach LOS	B	A										
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			24.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Walnut Street & Second Street

10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	9	9	2	2	4	2	112	3	3	51	2
Future Volume (vph)	13	9	9	2	2	4	2	112	3	3	51	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	10	10	2	2	4	2	122	3	3	55	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	34	8	127	60								
Volume Left (vph)	14	2	2	3								
Volume Right (vph)	10	4	3	2								
Hadj (s)	-0.06	-0.22	0.02	0.02								
Departure Headway (s)	4.2	4.1	4.1	4.1								
Degree Utilization, x	0.04	0.01	0.14	0.07								
Capacity (veh/h)	807	828	863	852								
Control Delay (s)	7.4	7.2	7.8	7.4								
Approach Delay (s)	7.4	7.2	7.8	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			16.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

5: Oak Street & Second Street

10/22/2020



















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	1	7	2	110	137	3
Future Volume (vph)	1	7	2	110	137	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	8	2	120	149	3
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	9	122	152			
Volume Left (vph)	1	2	0			
Volume Right (vph)	8	0	3			
Hadj (s)	-0.48	0.04	0.02			
Departure Headway (s)	4.0	4.1	4.1			
Degree Utilization, x	0.01	0.14	0.17			
Capacity (veh/h)	838	861	878			
Control Delay (s)	7.0	7.8	7.9			
Approach Delay (s)	7.0	7.8	7.9			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization			17.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Appendix D: Background Conditions Capacity Analyses

HCM Unsignalized Intersection Capacity Analysis

6: Oak Street & Cedar Avenue

10/22/2020





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	31	9	54	11	39	1	84	36	35	83	4
Future Volume (vph)	21	31	9	54	11	39	1	84	36	35	83	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	34	10	59	12	42	1	91	39	38	90	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	67	113	131	132								
Volume Left (vph)	23	59	1	38								
Volume Right (vph)	10	42	39	4								
Hadj (s)	0.01	-0.08	-0.14	0.07								
Departure Headway (s)	4.7	4.5	4.3	4.6								
Degree Utilization, x	0.09	0.14	0.16	0.17								
Capacity (veh/h)	714	744	786	747								
Control Delay (s)	8.1	8.3	8.2	8.5								
Approach Delay (s)	8.1	8.3	8.2	8.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			29.3%	ICU Level of Service	A							
Analysis Period (min)			15									

Appendix D: Background Conditions Capacity Analyses

HCM Signalized Intersection Capacity Analysis

1: Oak Street/Meredith Drive & Fairfax Boulevard

























10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	1198	25	78	1658	0	23	4	91	15	9	19
Future Volume (vph)	33	1198	25	78	1658	0	23	4	91	15	9	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	4.6		5.6	4.6			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1597	3496		1805	3406			1821	1615		1756	
Flt Permitted	0.08	1.00		0.16	1.00			0.96	1.00		0.98	
Satd. Flow (perm)	138	3496		307	3406			1821	1615		1756	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	1302	27	85	1802	0	25	4	99	16	10	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	94	0	14	0
Lane Group Flow (vph)	36	1329	0	85	1802	0	0	29	5	0	33	0
Heavy Vehicles (%)	13%	3%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		4	4		7	7	
Permitted Phases	2			6					4			
Actuated Green, G (s)	165.0	158.9		169.0	160.9			9.3	9.3		8.5	
Effective Green, g (s)	167.0	160.9		171.0	162.9			11.3	11.3		10.5	
Actuated g/C Ratio	0.76	0.73		0.78	0.74			0.05	0.05		0.05	
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5	6.5		6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	151	2556		300	2521			93	82		83	
v/s Ratio Prot	0.01	0.38		c0.01	c0.53			c0.02			c0.02	
v/s Ratio Perm	0.17			0.21					0.00			
v/c Ratio	0.24	0.52		0.28	0.71			0.31	0.06		0.39	
Uniform Delay, d1	15.4	12.8		9.3	15.7			100.6	99.3		101.7	
Progression Factor	0.82	0.57		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.7	0.7		0.5	1.8			1.9	0.3		3.1	
Delay (s)	13.4	8.0		9.8	17.5			102.5	99.6		104.7	
Level of Service	B	A		A	B			F	F		F	
Approach Delay (s)		8.1			17.2			100.3			104.7	
Approach LOS		A			B			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			220.0			Sum of lost time (s)			24.2			
Intersection Capacity Utilization			73.0%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Appendix D: Background Conditions Capacity Analyses

HCM Signalized Intersection Capacity Analysis  
2: Walnut Street/Fairchester Drive & Fairfax Boulevard

10/22/2020

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	22	1187	13	23	1662	14	17	27	35	34	24	14
Future Volume (vph)	22	1187	13	23	1662	14	17	27	35	34	24	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	3500		1805	3403		1805	1595		1752	1762	
Flt Permitted	0.09	1.00		0.18	1.00		0.72	1.00		0.56	1.00	
Satd. Flow (perm)	160	3500		349	3403		1370	1595		1032	1762	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	1290	14	25	1807	15	18	29	38	37	26	15
RTOR Reduction (vph)	0	0	0	0	0	0	0	25	0	0	10	0
Lane Group Flow (vph)	24	1304	0	25	1822	0	18	42	0	37	31	0
Heavy Vehicles (%)	8%	3%	0%	0%	6%	0%	0%	5%	12%	3%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			7			3	
Permitted Phases	2			6			7			3		
Actuated Green, G (s)	178.7	173.0		178.5	172.9		21.7	21.7		12.3	12.3	
Effective Green, g (s)	180.7	174.0		180.5	173.9		23.7	23.7		14.3	14.3	
Actuated g/C Ratio	0.82	0.79		0.82	0.79		0.11	0.11		0.07	0.07	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	2768		330	2689		147	171		67	114	
v/s Ratio Prot	c0.00	0.37		0.00	c0.54			c0.03			0.02	
v/s Ratio Perm	0.11			0.06			0.01			c0.04		
v/c Ratio	0.14	0.47		0.08	0.68		0.12	0.25		0.55	0.27	
Uniform Delay, d1	9.2	7.7		4.8	10.4		88.7	90.0		99.7	97.9	
Progression Factor	1.00	1.00		0.14	0.07		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.6		0.1	1.0		0.4	0.8		9.5	1.3	
Delay (s)	9.6	8.2		0.8	1.7		89.1	90.7		109.2	99.2	
Level of Service	A	A		A	A		F	F		F	F	
Approach Delay (s)		8.3			1.7			90.4			103.9	
Approach LOS		A			A			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			8.9	HCM 2000 Level of Service				A				
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			220.0	Sum of lost time (s)				20.7				
Intersection Capacity Utilization			63.4%	ICU Level of Service				B				
Analysis Period (min)			15									
c Critical Lane Group												

Appendix D: Background Conditions Capacity Analyses

HCM Unsignalized Intersection Capacity Analysis

3: Walnut Street & Cedar Avenue

10/22/2020

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	3	18	0	15	1	67	14	20	70	2
Future Volume (Veh/h)	3	0	3	18	0	15	1	67	14	20	70	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	0	3	20	0	16	1	73	15	22	76	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											366	
pX, platoon unblocked												
vC, conflicting volume	220	211	77	206	204	80	78			88		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220	211	77	206	204	80	78			88		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	100	98	100			99		
cM capacity (veh/h)	716	676	984	740	681	980	1520			1508		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	6	36	89	100								
Volume Left	3	20	1	22								
Volume Right	3	16	15	2								
cSH	829	830	1520	1508								
Volume to Capacity	0.01	0.04	0.00	0.01								
Queue Length 95th (ft)	1	3	0	1								
Control Delay (s)	9.4	9.5	0.1	1.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.4	9.5	0.1	1.7								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			21.6%		ICU Level of Service				A			
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis

4: Walnut Street & Second Street

10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	11	3	0	5	1	6	69	1	3	92	2
Future Volume (vph)	1	11	3	0	5	1	6	69	1	3	92	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	12	3	0	5	1	7	75	1	3	100	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	16	6	83	105								
Volume Left (vph)	1	0	7	3								
Volume Right (vph)	3	1	1	2								
Hadj (s)	-0.07	-0.07	0.04	0.03								
Departure Headway (s)	4.2	4.3	4.1	4.1								
Degree Utilization, x	0.02	0.01	0.09	0.12								
Capacity (veh/h)	808	805	860	876								
Control Delay (s)	7.3	7.3	7.5	7.6								
Approach Delay (s)	7.3	7.3	7.5	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			16.4%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

5: Oak Street & Second Street

10/22/2020



















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	3	10	4	119	115	2
Future Volume (vph)	3	10	4	119	115	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	4	129	125	2
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	14	133	127			
Volume Left (vph)	3	4	0			
Volume Right (vph)	11	0	2			
Hadj (s)	-0.39	0.04	0.02			
Departure Headway (s)	4.1	4.1	4.1			
Degree Utilization, x	0.02	0.15	0.14			
Capacity (veh/h)	830	862	871			
Control Delay (s)	7.1	7.8	7.8			
Approach Delay (s)	7.1	7.8	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization			19.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Oak Street & Cedar Avenue

10/22/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	5	9	19	6	9	6	102	25	7	101	20
Future Volume (vph)	12	5	9	19	6	9	6	102	25	7	101	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	5	10	21	7	10	7	111	27	8	110	22
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	28	38	145	140								
Volume Left (vph)	13	21	7	8								
Volume Right (vph)	10	10	27	22								
Hadj (s)	-0.09	-0.01	-0.07	-0.05								
Departure Headway (s)	4.5	4.5	4.1	4.2								
Degree Utilization, x	0.03	0.05	0.17	0.16								
Capacity (veh/h)	742	734	846	847								
Control Delay (s)	7.6	7.8	8.0	8.0								
Approach Delay (s)	7.6	7.8	8.0	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.9									
Level of Service			A									
Intersection Capacity Utilization			19.1%	ICU Level of Service								A
Analysis Period (min)			15									





















## APPENDIX E

### 2024 Total Future Capacity Analysis Worksheets

APPENDIX E: 2024 Total Future Capacity Analysis

HCM Signalized Intersection Capacity Analysis  
1: Oak Street/Meredith Drive & Fairfax Boulevard

07/22/2021

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	22	1831	20	72	678	3	41	12	89	9	1	19	
Future Volume (vph)	22	1831	20	72	678	3	41	12	89	9	1	19	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.6	4.6		5.6	4.6			4.5	4.5		4.5		
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00		
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.91		
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98		
Satd. Flow (prot)	1597	3500		1805	3404			1829	1615		1705		
Flt Permitted	0.36	1.00		0.03	1.00			0.96	1.00		0.98		
Satd. Flow (perm)	598	3500		66	3404			1829	1615		1705		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	24	1990	22	78	737	3	45	13	97	10	1	21	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	90	0	20	0	
Lane Group Flow (vph)	24	2012	0	78	740	0	0	58	7	0	12	0	
Heavy Vehicles (%)	13%	3%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA		
Protected Phases	5	2		1	6		4	4		7	7		
Permitted Phases	2			6					4				
Actuated Green, G (s)	131.3	126.9		142.3	132.4			11.5	11.5		6.5		
Effective Green, g (s)	133.3	128.9		144.3	134.4			13.5	13.5		8.5		
Actuated g/C Ratio	0.70	0.68		0.76	0.71			0.07	0.07		0.04		
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5	6.5		6.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0		
Lane Grp Cap (vph)	447	2374		149	2407			129	114		76		
v/s Ratio Prot	0.00	c0.57		c0.03	0.22			c0.03			c0.01		
v/s Ratio Perm	0.04			0.37					0.00				
v/c Ratio	0.05	0.85		0.52	0.31			0.45	0.06		0.16		
Uniform Delay, d1	8.7	23.1		44.4	10.4			84.7	82.3		87.3		
Progression Factor	1.01	0.68		1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	0.0	2.9		3.3	0.3			2.5	0.2		1.0		
Delay (s)	8.8	18.7		47.7	10.7			87.2	82.6		88.3		
Level of Service	A	B		D	B			F	F		F		
Approach Delay (s)		18.5			14.2			84.3			88.3		
Approach LOS		B			B			F			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			21.5									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.74										
Actuated Cycle Length (s)			190.0									Sum of lost time (s)	24.2
Intersection Capacity Utilization			75.8%									ICU Level of Service	D
Analysis Period (min)			15										
c	Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Walnut Street/Fairchester Drive & Fairfax Boulevard

07/22/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	10	1797	21	22	694	19	22	27	50	26	26	12
Future Volume (vph)	10	1797	21	22	694	19	22	27	50	26	26	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.90		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	3500		1805	3397		1805	1565		1752	1773	
Flt Permitted	0.35	1.00		0.07	1.00		0.73	1.00		0.47	1.00	
Satd. Flow (perm)	608	3500		128	3397		1388	1565		871	1773	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1953	23	24	754	21	24	29	54	28	28	13
RTOR Reduction (vph)	0	0	0	0	0	0	0	43	0	0	9	0
Lane Group Flow (vph)	11	1976	0	24	775	0	24	40	0	28	32	0
Heavy Vehicles (%)	8%	3%	0%	0%	6%	0%	0%	5%	12%	3%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			7			3	
Permitted Phases	2			6			7			3		
Actuated Green, G (s)	148.8	146.0		151.6	147.4		20.1	20.1		9.0	9.0	
Effective Green, g (s)	150.8	147.0		153.6	148.4		22.1	22.1		11.0	11.0	
Actuated g/C Ratio	0.79	0.77		0.81	0.78		0.12	0.12		0.06	0.06	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	503	2707		149	2653		161	182		50	102	
v/s Ratio Prot	0.00	c0.56		c0.00	0.23			c0.03			0.02	
v/s Ratio Perm	0.02			0.13			0.02			c0.03		
v/c Ratio	0.02	0.73		0.16	0.29		0.15	0.22		0.56	0.31	
Uniform Delay, d1	4.1	11.2		12.4	5.9		75.5	76.1		87.1	85.9	
Progression Factor	1.00	1.00		0.87	0.35		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.8		0.5	0.3		0.4	0.6		13.6	1.7	
Delay (s)	4.2	12.9		11.3	2.4		75.9	76.7		100.7	87.6	
Level of Service	A	B		B	A		E	E		F	F	
Approach Delay (s)		12.9			2.6			76.5			92.9	
Approach LOS		B			A			E			F	

















### Intersection Summary

HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Walnut Street & Cedar Avenue

















07/22/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	0	8	0	28	6	99	29	34	46	1
Future Volume (Veh/h)	1	0	0	8	0	28	6	99	29	34	46	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	0	9	0	30	7	108	32	37	50	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											366	
pX, platoon unblocked												
vC, conflicting volume	292	278	50	262	263	124	51			140		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	292	278	50	262	263	124	51			140		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	97	100			97		
cM capacity (veh/h)	624	611	1018	674	623	927	1555			1443		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1	39	147	88								
Volume Left	1	9	7	37								
Volume Right	0	30	32	1								
cSH	624	853	1555	1443								
Volume to Capacity	0.00	0.05	0.00	0.03								
Queue Length 95th (ft)	0	4	0	2								
Control Delay (s)	10.8	9.4	0.4	3.3								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.8	9.4	0.4	3.3								
Approach LOS	B	A										
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			25.0%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 4: Walnut Street & Second Street

07/22/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	9	9	2	2	4	2	114	3	3	53	2
Future Volume (vph)	13	9	9	2	2	4	2	114	3	3	53	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	10	10	2	2	4	2	124	3	3	58	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	34	8	129	63								
Volume Left (vph)	14	2	2	3								
Volume Right (vph)	10	4	3	2								
Hadj (s)	-0.06	-0.22	0.02	0.02								
Departure Headway (s)	4.3	4.1	4.1	4.1								
Degree Utilization, x	0.04	0.01	0.15	0.07								
Capacity (veh/h)	804	825	862	852								
Control Delay (s)	7.4	7.2	7.8	7.5								
Approach Delay (s)	7.4	7.2	7.8	7.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			16.8%	ICU Level of Service	A							
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 5: Oak Street & Second Street

















07/22/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	1	7	2	111	141	3
Future Volume (vph)	1	7	2	111	141	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	8	2	121	153	3
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	9	123	156			
Volume Left (vph)	1	2	0			
Volume Right (vph)	8	0	3			
Hadj (s)	-0.48	0.04	0.02			
Departure Headway (s)	4.0	4.1	4.1			
Degree Utilization, x	0.01	0.14	0.18			
Capacity (veh/h)	835	860	877			
Control Delay (s)	7.1	7.8	7.9			
Approach Delay (s)	7.1	7.8	7.9			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization			17.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
6: Oak Street & Cedar Avenue

07/22/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	31	10	54	11	39	5	92	36	35	86	4
Future Volume (vph)	21	31	10	54	11	39	5	92	36	35	86	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	34	11	59	12	42	5	100	39	38	93	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	68	113	144	135								
Volume Left (vph)	23	59	5	38								
Volume Right (vph)	11	42	39	4								
Hadj (s)	0.00	-0.08	-0.12	0.07								
Departure Headway (s)	4.7	4.6	4.4	4.6								
Degree Utilization, x	0.09	0.14	0.18	0.17								
Capacity (veh/h)	707	735	781	744								
Control Delay (s)	8.2	8.3	8.3	8.5								
Approach Delay (s)	8.2	8.3	8.3	8.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			33.5%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 101: Site Driveway A & Fairfax Boulevard

07/22/2021



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	1870	2	3	734	0	1
Future Volume (Veh/h)	1870	2	3	734	0	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2033	2	3	798	0	1
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	250		387			
pX, platoon unblocked			0.68		0.72	0.68
vC, conflicting volume			2035		2439	1018
vC1, stage 1 conf vol					2034	
vC2, stage 2 conf vol					405	
vCu, unblocked vol			1587		1730	96
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			280		102	643
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1355	680	3	399	399	1
Volume Left	0	0	3	0	0	0
Volume Right	0	2	0	0	0	1
cSH	1700	1700	280	1700	1700	643
Volume to Capacity	0.80	0.40	0.01	0.23	0.23	0.00
Queue Length 95th (ft)	0	0	1	0	0	0
Control Delay (s)	0.0	0.0	18.0	0.0	0.0	10.6
Lane LOS	C			B		
Approach Delay (s)	0.0		0.1			10.6
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			61.8%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 102: Walnut Street & Site Driveway B

07/22/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	1	131	1	0	81
Future Volume (Veh/h)	0	1	131	1	0	81
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	142	1	0	88
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						131
pX, platoon unblocked	0.99					
vC, conflicting volume	230	72			143	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	215	72			143	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	745	976			1437	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>		
Volume Total	1	95	48	88		
Volume Left	0	0	0	0		
Volume Right	1	0	1	0		
cSH	976	1700	1700	1700		
Volume to Capacity	0.00	0.06	0.03	0.05		
Queue Length 95th (ft)	0	0	0	0		
Control Delay (s)	8.7	0.0	0.0	0.0		
Lane LOS	A					
Approach Delay (s)	8.7	0.0			0.0	
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			14.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 103: Walnut Street & Site Driveway C

07/22/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	6	126	1	2	79
Future Volume (Veh/h)	2	6	126	1	2	79
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	7	137	1	2	86
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)					264	
pX, platoon unblocked						
vC, conflicting volume	228		138		138	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	224		138		138	
tC, single (s)	6.4		6.2		4.1	
tC, 2 stage (s)						
tF (s)	3.5		3.3		2.2	
p0 queue free %	100		99		100	
cM capacity (veh/h)	761		911		1446	
<b>Direction, Lane #</b>						
	WB 1		NB 1		SB 1	
Volume Total	9		138		88	
Volume Left	2		0		2	
Volume Right	7		1		0	
cSH	873		1700		1446	
Volume to Capacity	0.01		0.08		0.00	
Queue Length 95th (ft)	1		0		0	
Control Delay (s)	9.2		0.0		0.2	
Lane LOS	A				A	
Approach Delay (s)	9.2		0.0		0.2	
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization			16.7%		ICU Level of Service	
Analysis Period (min)			15			
					A	

HCM Unsignalized Intersection Capacity Analysis  
 104: Oak Street & Site Driveway D

07/22/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	4	1	121	147	4
Future Volume (Veh/h)	12	4	1	121	147	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	4	1	132	160	4
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	296	162	164			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	296	162	164			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	695	883	1414			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	17	133	164			
Volume Left	13	1	0			
Volume Right	4	0	4			
cSH	731	1414	1700			
Volume to Capacity	0.02	0.00	0.10			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	10.0	0.1	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.0	0.1	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization			18.0%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 1: Oak Street/Meredith Drive & Fairfax Boulevard

07/22/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↕	
Traffic Volume (vph)	33	1224	25	87	1685	0	23	4	96	15	9	19
Future Volume (vph)	33	1224	25	87	1685	0	23	4	96	15	9	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	4.6		5.6	4.6			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1597	3496		1805	3406			1821	1615		1756	
Flt Permitted	0.08	1.00		0.15	1.00			0.96	1.00		0.98	
Satd. Flow (perm)	131	3496		294	3406			1821	1615		1756	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	1330	27	95	1832	0	25	4	104	16	10	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	99	0	14	0
Lane Group Flow (vph)	36	1357	0	95	1832	0	0	29	5	0	33	0
Heavy Vehicles (%)	13%	3%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		4	4		7	7	
Permitted Phases	2			6					4			
Actuated Green, G (s)	164.6	158.4		169.4	160.8			9.3	9.3		8.5	
Effective Green, g (s)	166.6	160.4		171.4	162.8			11.3	11.3		10.5	
Actuated g/C Ratio	0.76	0.73		0.78	0.74			0.05	0.05		0.05	
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5	6.5		6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	147	2548		294	2520			93	82		83	
v/s Ratio Prot	0.01	0.39		c0.01	c0.54			c0.02			c0.02	
v/s Ratio Perm	0.18			0.24					0.00			
v/c Ratio	0.24	0.53		0.32	0.73			0.31	0.07		0.39	
Uniform Delay, d1	16.2	13.2		9.8	16.1			100.6	99.3		101.7	
Progression Factor	0.96	0.64		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.8	0.7		0.6	1.9			1.9	0.3		3.1	
Delay (s)	16.4	9.1		10.5	18.0			102.5	99.7		104.7	
Level of Service	B	A		B	B			F	F		F	
Approach Delay (s)		9.3			17.6			100.3			104.7	
Approach LOS		A			B			F			F	

### Intersection Summary

HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: Walnut Street/Fairchester Drive & Fairfax Boulevard

07/22/2021



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑		↗	↑↑		↗	↑		↗	↑	
Traffic Volume (vph)	22	1204	19	28	1665	14	36	30	38	36	24	14
Future Volume (vph)	22	1204	19	28	1665	14	36	30	38	36	24	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.92		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	3498		1805	3403		1805	1600		1752	1762	
Flt Permitted	0.09	1.00		0.18	1.00		0.72	1.00		0.52	1.00	
Satd. Flow (perm)	158	3498		337	3403		1372	1600		966	1762	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	1309	21	30	1810	15	39	33	41	39	26	15
RTOR Reduction (vph)	0	0	0	0	0	0	0	24	0	0	10	0
Lane Group Flow (vph)	24	1330	0	30	1825	0	39	50	0	39	31	0
Heavy Vehicles (%)	8%	3%	0%	0%	6%	0%	0%	5%	12%	3%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			7			3	
Permitted Phases	2			6			7			3		
Actuated Green, G (s)	178.0	172.3		178.0	172.3		22.3	22.3		12.9	12.9	
Effective Green, g (s)	180.0	173.3		180.0	173.3		24.3	24.3		14.9	14.9	
Actuated g/C Ratio	0.82	0.79		0.82	0.79		0.11	0.11		0.07	0.07	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	175	2755		320	2680		151	176		65	119	
v/s Ratio Prot	c0.00	0.38		0.00	c0.54			c0.03			0.02	
v/s Ratio Perm	0.11			0.07			0.03			c0.04		
v/c Ratio	0.14	0.48		0.09	0.68		0.26	0.28		0.60	0.26	
Uniform Delay, d1	9.5	8.0		5.1	10.7		89.6	89.9		99.7	97.3	
Progression Factor	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.6		0.1	1.4		0.9	0.9		14.0	1.2	
Delay (s)	9.9	8.6		5.2	12.0		90.5	90.8		113.7	98.5	
Level of Service	A	A		A	B		F	F		F	F	
Approach Delay (s)		8.6			11.9			90.7			105.9	
Approach LOS		A			B			F			F	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



HCM Unsignalized Intersection Capacity Analysis  
 3: Walnut Street & Cedar Avenue

















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	0	3	18	0	18	1	76	14	24	79	2
Future Volume (vph)	3	0	3	18	0	18	1	76	14	24	79	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	0	3	20	0	20	1	83	15	26	86	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	6	40	99	114								
Volume Left (vph)	3	20	1	26								
Volume Right (vph)	3	20	15	2								
Hadj (s)	-0.17	-0.17	-0.05	0.07								
Departure Headway (s)	4.2	4.2	4.1	4.2								
Degree Utilization, x	0.01	0.05	0.11	0.13								
Capacity (veh/h)	801	813	863	848								
Control Delay (s)	7.3	7.4	7.6	7.8								
Approach Delay (s)	7.3	7.4	7.6	7.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			22.3%	ICU Level of Service	A							
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 4: Walnut Street & Second Street

07/22/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	11	3	0	5	1	6	78	1	3	101	2
Future Volume (vph)	1	11	3	0	5	1	6	78	1	3	101	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	12	3	0	5	1	7	85	1	3	110	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	16	6	93	115								
Volume Left (vph)	1	0	7	3								
Volume Right (vph)	3	1	1	2								
Hadj (s)	-0.07	-0.07	0.04	0.03								
Departure Headway (s)	4.3	4.3	4.1	4.1								
Degree Utilization, x	0.02	0.01	0.11	0.13								
Capacity (veh/h)	796	794	858	873								
Control Delay (s)	7.4	7.3	7.6	7.7								
Approach Delay (s)	7.4	7.3	7.6	7.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			16.9%	ICU Level of Service	A							
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 5: Oak Street & Second Street

















07/22/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	3	10	4	123	117	2
Future Volume (vph)	3	10	4	123	117	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	4	134	127	2
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	14	138	129			
Volume Left (vph)	3	4	0			
Volume Right (vph)	11	0	2			
Hadj (s)	-0.39	0.04	0.02			
Departure Headway (s)	4.1	4.1	4.1			
Degree Utilization, x	0.02	0.16	0.15			
Capacity (veh/h)	826	862	870			
Control Delay (s)	7.1	7.9	7.8			
Approach Delay (s)	7.1	7.9	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization			19.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
6: Oak Street & Cedar Avenue

07/22/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	5	13	19	6	9	9	107	25	7	110	20
Future Volume (vph)	12	5	13	19	6	9	9	107	25	7	110	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	5	14	21	7	10	10	116	27	8	120	22
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	32	38	153	150								
Volume Left (vph)	13	21	10	8								
Volume Right (vph)	14	10	27	22								
Hadj (s)	-0.15	-0.01	-0.06	-0.04								
Departure Headway (s)	4.5	4.6	4.2	4.2								
Degree Utilization, x	0.04	0.05	0.18	0.17								
Capacity (veh/h)	742	724	839	841								
Control Delay (s)	7.6	7.8	8.1	8.1								
Approach Delay (s)	7.6	7.8	8.1	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.0									
Level of Service			A									
Intersection Capacity Utilization			20.3%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 101: Site Driveway A & Fairfax Boulevard

07/22/2021



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	1257	19	23	22	3	23
Future Volume (Veh/h)	1257	19	23	22	3	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1366	21	25	24	3	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	250		387			
pX, platoon unblocked			0.87		0.87	0.87
vC, conflicting volume			1387		1438	694
vC1, stage 1 conf vol					1376	
vC2, stage 2 conf vol					62	
vCu, unblocked vol			1141		1201	342
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			95		99	96
cM capacity (veh/h)			528		228	567
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	911	476	25	12	12	28
Volume Left	0	0	25	0	0	3
Volume Right	0	21	0	0	0	25
cSH	1700	1700	528	1700	1700	489
Volume to Capacity	0.54	0.28	0.05	0.01	0.01	0.06
Queue Length 95th (ft)	0	0	4	0	0	5
Control Delay (s)	0.0	0.0	12.2	0.0	0.0	12.8
Lane LOS			B			B
Approach Delay (s)	0.0		6.2			12.8
Approach LOS						B
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			45.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 102: Walnut Street & Site Driveway B

07/22/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	18	92	7	0	103
Future Volume (Veh/h)	8	18	92	7	0	103
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	20	100	8	0	112
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	145					
pX, platoon unblocked	0.99					
vC, conflicting volume	216	54			108	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	204	54			108	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			100	
cM capacity (veh/h)	759	1002			1480	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>		
Volume Total	29	67	41	112		
Volume Left	9	0	0	0		
Volume Right	20	0	8	0		
cSH	911	1700	1700	1700		
Volume to Capacity	0.03	0.04	0.02	0.07		
Queue Length 95th (ft)	2	0	0	0		
Control Delay (s)	9.1	0.0	0.0	0.0		
Lane LOS	A					
Approach Delay (s)	9.1	0.0			0.0	
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization			15.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 103: Walnut Street & Site Driveway C

07/22/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	4	95	2	7	104
Future Volume (Veh/h)	1	4	95	2	7	104
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	4	103	2	8	113
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked	1.00					261
vC, conflicting volume	233	104			105	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	233	104			105	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	751	951			1486	
<b>Direction, Lane #</b>						
	WB 1	NB 1	SB 1			
Volume Total	5	105	121			
Volume Left	1	0	8			
Volume Right	4	2	0			
cSH	903	1700	1486			
Volume to Capacity	0.01	0.06	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	9.0	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	0.5			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		21.2%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 104: Oak Street & Site Driveway D

07/22/2021



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	2	4	133	129	13
Future Volume (Veh/h)	7	2	4	133	129	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	2	4	145	140	14
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	300	147	154			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	300	147	154			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	690	900	1426			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	10	149	154			
Volume Left	8	4	0			
Volume Right	2	0	14			
cSH	723	1426	1700			
Volume to Capacity	0.01	0.00	0.09			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	10.0	0.2	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.0	0.2	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay	0.4					
Intersection Capacity Utilization	20.2%			ICU Level of Service	A	
Analysis Period (min)	15					



## APPENDIX F

Alternative Additional Analyses Including the Potential  
Redevelopment of the American Legion (Toll  
Brothers) Site as Pipeline Development and a  
Potential Future Bike Lane on Walnut Street (By  
Others)

### Alternative Table 7-1 - With Potential American Legion (Toll Brothers) Redevelopment

#### Breezeway Property

#### Total Future Intersection Capacity Analysis Summary

Intersection	Intersection Control	Approach	Existing		Background Future		Total Future	
			AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
1. Fairfax Boulevard & Meredith Drive/Oak Street	Signal	EB Appr	B (17.8)	A (8.8)	B (18.7)	A (9.1)	B (18.8)	A (9.9)
		WB Appr	B (14.9)	B (17.3)	B (15.9)	B (17.3)	B (16.5)	B (17.8)
		NB Appr	F (87.1)	F (100.2)	F (84.2)	F (100.0)	F (84.1)	F (100.0)
		SB Appr	F (88.4)	F (102.4)	F (88.3)	F (104.7)	F (88.3)	F (104.7)
		<b>Overall</b>	<b>C (21.2)</b>	<b>B (18.7)</b>	<b>C (22.3)</b>	<b>B (18.9)</b>	<b>C (22.7)</b>	<b>B (19.5)</b>
2. Fairfax Boulevard & Fairchester Drive/Walnut Street <u>Includes potential future reduction to single northbound lane on Walnut Street</u>	Signal	EB Appr	B (13.0)	A (8.0)	B (12.8)	A (8.3)	B (15.2)	B (10.9)
		WB Appr	A (3.0)	A (1.7)	A (2.8)	A (1.7)	A (3.1)	A (6.0)
		NB Appr	E (76.5)	F (90.3)	E (76.6)	F (90.4)	E (76.3)	F (89.8)
		SB Appr	F (92.7)	F (105.7)	F (91.7)	F (103.9)	F (87.6)	F (95.6)
		<b>Overall</b>	<b>B (14.6)</b>	<b>A (9.4)</b>	<b>B (14.0)</b>	<b>A (8.9)</b>	<b>B (15.8)</b>	<b>B (12.8)</b>
3. Walnut Street/Cedar Avenue	Stop Control	EB Appr	A (0.0)	A (9.4)	B (10.7)	A (9.4)	A (7.7)	A (7.3)
		WB Appr	A (9.4)	A (9.6)	A (9.4)	A (9.5)	A (7.2)	A (7.4)
		NB Appr	A (0.4)	A (0.1)	A (0.4)	A (0.1)	A (7.8)	A (7.6)
		SB Appr	A (3.2)	A (1.5)	A (3.3)	A (1.7)	A (7.7)	A (7.8)
		<b>Overall</b>	<b>A (2.4)</b>	<b>A (2.5)</b>	<b>A (2.6)</b>	<b>A (2.5)</b>	<b>A (7.7)</b>	<b>A (7.6)</b>
4. Walnut Street/Second Street	Stop	EB Appr	A (7.5)	A (7.3)	A (7.4)	A (7.3)	A (7.4)	A (7.4)
		WB Appr	A (7.2)	A (7.3)	A (7.2)	A (7.3)	A (7.2)	A (7.3)
		NB Appr	A (7.8)	A (7.5)	A (7.8)	A (7.5)	A (7.8)	A (7.6)
		SB Appr	A (7.5)	A (7.7)	A (7.4)	A (7.6)	A (7.5)	A (7.7)
		<b>Overall</b>	<b>A (7.7)</b>	<b>A (7.6)</b>	<b>A (7.6)</b>	<b>A (7.5)</b>	<b>A (7.6)</b>	<b>A (7.6)</b>
5. Oak Street/Second Street	Stop	EB Appr	A (7.0)	A (7.1)	A (7.1)	A (7.2)	A (7.1)	A (7.3)
		NB Appr	A (7.7)	A (7.7)	A (7.9)	A (8.1)	A (7.9)	A (8.1)
		SB Appr	A (7.8)	A (7.7)	A (8.1)	A (8.0)	A (8.1)	A (8.0)
		<b>Overall</b>	<b>A (7.7)</b>	<b>A (7.7)</b>	<b>A (8.0)</b>	<b>A (8.0)</b>	<b>A (8.0)</b>	<b>A (8.0)</b>
6. Oak Street/Cedar Avenue/Panther Place	Stop	EB Appr	A (8.1)	A (7.6)	A (8.2)	A (7.8)	A (8.3)	A (7.8)
		WB Appr	A (8.0)	A (7.5)	A (8.4)	A (7.9)	A (8.5)	A (8.0)
		NB Appr	A (8.1)	A (7.9)	A (8.5)	A (8.2)	A (8.6)	A (8.3)
		SB Appr	A (8.4)	A (7.9)	A (8.7)	A (8.2)	A (8.7)	A (8.4)
		<b>Overall</b>	<b>A (8.2)</b>	<b>A (7.8)</b>	<b>A (8.5)</b>	<b>A (8.2)</b>	<b>A (8.6)</b>	<b>A (8.3)</b>
A. Fairfax Boulevard/ Site Driveway	Stop	EB Appr	Future Intersection	Future Intersection	A (0.0)	A (0.0)		
		WB Appr			A (0.1)	A (0.2)		
		NB Appr			B (10.1)	B (12.4)		
		<b>Overall</b>			<b>B (0.0)</b>	<b>B (0.2)</b>		
B. Walnut Street/ Commercial Site Driveway	Stop	WB Appr	Future Intersection	Future Intersection	A (9.0)	A (9.2)		
		NB Appr			A (0.0)	A (0.0)		
		SB Appr			A (0.0)	A (0.0)		
		<b>Overall</b>			<b>A (0.0)</b>	<b>A (1.1)</b>		
C. Walnut Street/ Residential Site Driveway	Stop	WB Appr	Future Intersection	Future Intersection	A (9.2)	A (9.0)		
		NB Appr			A (0.0)	A (0.0)		
		SB Appr			A (0.2)	A (0.5)		
		<b>Overall</b>			<b>A (0.4)</b>	<b>A (0.5)</b>		
D. Oak Street/ Residential Driveway To be aligned with the relocated American Legion / Toll Brothers Driveway	Stop	EB Appr	Future Intersection	Future Intersection	B (10.9)	B (11.3)		
		WB Appr			B (10.7)	B (10.9)		
		NB Appr			A (0.1)	A (0.2)		
		SB Appr			A (0.9)	A (1.6)		
		<b>Overall</b>			<b>A (2.0)</b>	<b>A (2.2)</b>		

# App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

I: Meredith Drive/Fairfax Boulevard  
Trip Distribution

Traffic Component	Southbound Meredith Drive			Westbound Fairfax Boulevard			Northbound Oak Street			Eastbound Fairfax Boulevard		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Pipeline Developments</b>	Assignment Per Novus Gateway TIA Assignment Per Paul VI TIA Assignment per Toll Brothers - American Legion TIA											
Novus Fairfax Gateway												
Paul VI - Redevelopment												
Toll Brothers - American Legion												
<b>Breezeway Site Development</b>												
Commercial							45%			-45%		
Two Over Two Town Homes							50%			-50%		
Town Homes							50%			-50%		

I: Meredith Drive/Fairfax Boulevard  
AM Peak Hour

2024

Traffic Component	Southbound Meredith Drive			Westbound Fairfax Boulevard			Northbound Oak Street			Eastbound Fairfax Boulevard				
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left		
<b>Existing Traffic Volume</b>	18	1	9	3	588	67	79	12	38	18	1,692	21		
Growth	1	-	-	-	18	2	2	-	1	1	51	1		
Existing Adjusted	19	1	9	3	606	69	81	12	39	19	1,743	22		
<b>Pipeline Developments</b>	IN	OUT												
Novus Fairfax Gateway	117	214												
Paul VI - Redevelopment	71	141												
Toll Brothers - American Legion	26	48												
Subtotal	214	403	-	-	-	-	68	16	24	-	2	1	83	-
<b>Background (With Toll Brothers Included)</b>	19	1	9	3	674	85	105	12	41	20	1,826	22		
<b>Site Assignment</b>														
Commercial	6	3	-	-	-	-	-	3	-	-	-	1	-	
Two Over Two Town Homes	2	8	-	-	-	-	-	1	-	-	-	4	-	
Town Homes	5	16	-	-	-	-	-	-	3	-	-	-	-	
Site Total	13	27	-	-	-	-	-	4	3	8	-	-	5	
<b>Total Future (With Toll Brothers Included)</b>	19	1	9	3	678	88	113	12	41	20	1,831	22		

I: Meredith Drive/Fairfax Boulevard  
PM Peak Hour

Traffic Component	Southbound Meredith Drive			Westbound Fairfax Boulevard			Northbound Oak Street			Eastbound Fairfax Boulevard			
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	
<b>Existing Traffic Volume</b>	18	9	15	-	1,455	76	88	4	21	22	1,031	32	
Growth	1	-	-	-	44	2	3	-	1	1	31	1	
Existing Adjusted	19	9	15	-	1,499	78	91	4	22	23	1,062	33	
<b>Pipeline Developments</b>	IN	OUT											
Novus Fairfax Gateway	295	206											
Paul VI - Redevelopment	221	190											
Toll Brothers - American Legion	26	48											
Subtotal	542	444	-	-	-	-	159	29	23	-	1	2	136
<b>Background (With Toll Brothers Included)</b>	19	9	15	-	1,658	107	114	4	23	25	1,198	33	
<b>Site Assignment</b>													
Commercial	48	51	-	-	-	-	-	22	-	-	-	23	-
Two Over Two Town Homes	9	5	-	-	-	-	-	5	-	-	-	3	-
Town Homes	17	10	-	-	-	-	-	9	-	-	-	-	-
Site Total	74	66	-	-	-	-	-	27	9	5	-	-	26
<b>Total Future (With Toll Brothers Included)</b>	19	9	15	-	1,685	116	119	4	23	25	1,224	33	

# App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

2: Fairchester Drive/Fairfax Boulevard  
Trip Distribution

Traffic Component	Southbound Fairchester Drive			Westbound Fairfax Boulevard			Northbound Walnut Street			Eastbound Fairfax Boulevard			
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	
Pipeline Developments													
Novus Fairfax Gateway													
Paul VI - Redevelopment													
Toll Brothers - American Legion													
<b>Breezeway Site Development</b>													
Commercial			5%		-5%				-5%		-30%		35%
Two Over Two Town Homes					50%			-50%		-25%			25%
Town Homes										-25%			25%

2: Fairchester Drive/Fairfax Boulevard  
AM Peak Hour

2024

Traffic Component	Southbound Fairchester Drive			Westbound Fairfax Boulevard			Northbound Walnut Street			Eastbound Fairfax Boulevard		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	12	25	25	18	606	20	45	26	13	17	1,661	10
Growth	-	1	1	1	18	1	1	1	-	1	50	-
Existing Adjusted	12	26	26	19	624	21	46	27	13	18	1,711	10
Pipeline Developments		IN	OUT									
Novus Fairfax Gateway		117	214		22						50	
Paul VI - Redevelopment		71	141		48				2		34	
Toll Brothers - American Legion		26	48									
Subtotal	214	403			70	-		-	2		84	-
<b>Background (With Toll Brothers Included)</b>	12	26	26	19	694	21	46	27	15	19	1,795	10
<b>Site Assignment</b>												
Commercial	6	3	-	-	-	-	-	-	1	-	2	-
Two Over Two Town Homes	2	8	-	-	-	1	4	-	2	1	-	-
Town Homes	5	16	-	-	-	-	-	-	4	1	-	-
Site Total	13	27	-	-	-	1	4	-	7	2	2	-
<b>Total Future (With Toll Brothers Included)</b>	12	26	26	19	694	22	50	27	22	21	1,797	10

2: Fairchester Drive/Fairfax Boulevard  
PM Peak Hour

Traffic Component	Southbound Fairchester Drive			Westbound Fairfax Boulevard			Northbound Walnut Street			Eastbound Fairfax Boulevard		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	14	23	33	14	1,458	22	34	26	16	11	1,018	21
Growth	-	1	1	-	44	1	1	1	-	-	31	1
Existing Adjusted	14	24	34	14	1,502	23	35	27	16	11	1,049	22
Pipeline Developments		IN	OUT									
Novus Fairfax Gateway		295	206		60						32	
Paul VI - Redevelopment		221	190		100				1		106	
Toll Brothers - American Legion		26	48									
Subtotal	542	444			160	-		-	1		138	-
<b>Background (With Toll Brothers Included)</b>	14	24	34	14	1,662	23	35	27	17	13	1,187	22
<b>Site Assignment</b>												
Commercial	48	51	-	-	3	-	-	3	15	-	17	-
Two Over Two Town Homes	9	5	-	-	-	5	3	-	1	2	-	-
Town Homes	17	10	-	-	-	-	-	-	3	4	-	-
Site Total	74	66	-	-	3	5	3	3	19	6	17	-
<b>Total Future (With Toll Brothers Included)</b>	14	24	36	14	1,665	28	38	30	36	19	1,204	22

# App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

3: Walnut Street/Cedar Avenue  
Trip Distribution

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Cedar Avenue</u>			Northbound <u>Walnut Street</u>			Eastbound <u>Commercial Drive</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Pipeline Developments</b>												
Novus Fairfax Gateway												
Paul VI - Redevelopment												
Toll Brothers - American Legion												
<b>Breezeway Site Development</b>												
Commercial		-15%							15%			
Two Over Two Town Homes		-25%							25%			
Town Homes			25%		-25%							

3: Walnut Street/Cedar Avenue  
AM Peak Hour

2024

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Cedar Avenue</u>			Northbound <u>Walnut Street</u>			Eastbound <u>Commercial Drive</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	1	43	31	21	-	7	28	94	6	-	-	1
Growth	-	1	1	1	-	-	1	3	-	-	-	-
Existing Adjusted	1	44	32	22	-	7	29	97	6	-	-	1
Pipeline Developments												
IN												
OUT												
Novus Fairfax Gateway	117	214										
Paul VI - Redevelopment	71	141	1	2		1						
Toll Brothers - American Legion	26	48										
Subtotal	214	403	1	2	-	1	-	-	-	-	-	-
<b>Background (With Toll Brothers Included)</b>	1	44	33	24	-	8	29	97	6	-	-	1
<b>Site Assignment</b>												
Commercial	6	3	-	-	-	-	-	1	-	-	-	-
Two Over Two Town Homes	2	8	-	-	-	-	-	1	-	-	-	-
Town Homes	5	16	1	4	-	-	-	-	-	-	-	-
Site Total	13	27	1	4	-	-	-	2	-	-	-	-
<b>Total Future (With Toll Brothers Included)</b>	1	46	34	28	-	8	29	99	6	-	-	1

3: Walnut Street/Cedar Avenue  
PM Peak Hour

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Cedar Avenue</u>			Northbound <u>Walnut Street</u>			Eastbound <u>Commercial Drive</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	2	68	17	14	-	17	13	65	1	3	-	3
Growth	-	2	1	-	-	1	-	2	-	-	-	-
Existing Adjusted	2	70	18	14	-	18	13	67	1	3	-	3
Pipeline Developments												
IN												
OUT												
Novus Fairfax Gateway	295	206										
Paul VI - Redevelopment	221	190	2	1			1					
Toll Brothers - American Legion	26	48										
Subtotal	542	444	2	1	-	-	1	-	-	-	-	-
<b>Background (With Toll Brothers Included)</b>	2	70	20	15	-	18	14	67	1	3	-	3
<b>Site Assignment</b>												
Commercial	48	51	-	-	-	-	-	7	-	-	-	-
Two Over Two Town Homes	9	5	-	-	-	-	-	2	-	-	-	-
Town Homes	17	10	4	3	-	-	-	-	-	-	-	-
Site Total	74	66	4	3	-	-	-	9	-	-	-	-
<b>Total Future (With Toll Brothers Included)</b>	2	79	24	18	-	18	14	76	1	3	-	3

# App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

4: Walnut Street/Second Street  
Trip Distribution

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Second Street</u>			Northbound <u>Walnut Street</u>			Eastbound <u>Second Street</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Pipeline Developments												
Novus Fairfax Gateway												
Paul VI - Redevelopment												
Toll Brothers - American Legion												
<b>Breezeway Site Development</b>												
Commercial		-15%							15%			
Two Over Two Town Homes		-25%							25%			
Town Homes												

4: Walnut Street/Second Street  
AM Peak Hour

2024

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Second Street</u>			Northbound <u>Walnut Street</u>			Eastbound <u>Second Street</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	2	49	3	4	2	2	3	109	2	9	9	13
Growth	-	1	-	-	-	-	-	3	-	-	-	-
Existing Adjusted	2	50	3	4	2	2	3	112	2	9	9	13
Pipeline Developments												
IN												
OUT												
Novus Fairfax Gateway		117	214									
Paul VI - Redevelopment		71	141									
Toll Brothers - American Legion		26	48									
Subtotal	214	403										
<b>Background (With Toll Brothers Included)</b>	2	51	3	4	2	2	3	112	2	9	9	13
<b>Site Assignment</b>												
Commercial	6	3						1				
Two Over Two Town Homes	2	8						1				
Town Homes	5	16										
<b>Site Total</b>	13	27						2				
<b>Total Future (With Toll Brothers Included)</b>	2	53	3	4	2	2	3	114	2	9	9	13

4: Walnut Street/Second Street  
PM Peak Hour

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Second Street</u>			Northbound <u>Walnut Street</u>			Eastbound <u>Second Street</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	2	89	3	1	5	-	1	66	6	3	11	1
Growth	-	3	-	-	-	-	-	2	-	-	-	-
Existing Adjusted	2	92	3	1	5	-	1	68	6	3	11	1
Pipeline Developments												
IN												
OUT												
Novus Fairfax Gateway		295	206									
Paul VI - Redevelopment		221	190					1				
Toll Brothers - American Legion		26	48									
Subtotal	542	444						1				
<b>Background (With Toll Brothers Included)</b>	2	92	3	1	5	-	1	69	6	3	11	1
<b>Site Assignment</b>												
Commercial	48	51						7				
Two Over Two Town Homes	9	5						2				
Town Homes	17	10										
<b>Site Total</b>	74	66						9				
<b>Total Future (With Toll Brothers Included)</b>	2	101	3	1	5	-	1	78	6	3	11	1

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

5.: Oak Street/Second Street  
Trip Distribution

Traffic Component	Southbound <u>Oak Street</u>			Westbound <u>Future Toll Brothers</u>			Northbound <u>Oak Street</u>			Eastbound <u>Second Street</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Pipeline Developments												
Novus Fairfax Gateway												
Paul VI - Redevelopment												
Toll Brothers - American Legion												
<b>Breezeway Site Development</b>												
Commercial												
Two Over Two Town Homes												
Town Homes												
		-25%							25%			

5.: Oak Street/Second Street  
AM Peak Hour

2024

Traffic Component	Southbound <u>Oak Street</u>			Westbound <u>No Road</u>			Northbound <u>Oak Street</u>			Eastbound <u>Second Street</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	3	112	-	-	-	-	-	101	2	7	-	1
Growth	-	3	-	-	-	-	-	3	-	-	-	-
Existing Adjusted	3	115	-	-	-	-	-	104	2	7	-	1
Pipeline Developments												
Novus Fairfax Gateway		117	214									
Paul VI - Redevelopment		71	141			22		6				
Toll Brothers - American Legion		26	48			24		16				
Subtotal	214	403		-	46	-	-	22	-	-	-	-
<b>Background (With Toll Brothers Included)</b>	3	161	-	-	-	-	-	126	2	7	-	1
<b>Site Assignment</b>												
Commercial	6	3		-	-	-	-	-	-	-	-	-
Two Over Two Town Homes	2	8		-	-	-	-	-	-	-	-	-
Town Homes	5	16		-	4	-	-	1	-	-	-	-
<b>Site Total</b>	13	27		-	4	-	-	1	-	-	-	-
<b>Total Future (With Toll Brothers Included)</b>	3	165	-	-	-	-	-	127	2	7	-	1

5.: Oak Street/Second Street  
PM Peak Hour

Traffic Component	Southbound <u>Oak Street</u>			Westbound <u>No Road</u>			Northbound <u>Oak Street</u>			Eastbound <u>Second Street</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	2	99	-	-	-	-	-	95	4	10	-	3
Growth	-	3	-	-	-	-	-	3	-	-	-	-
Existing Adjusted	2	102	-	-	-	-	-	98	4	10	-	3
Pipeline Developments												
Novus Fairfax Gateway		295	206									
Paul VI - Redevelopment		221	190			13		21				
Toll Brothers - American Legion		26	48			23		29				
Subtotal	542	444		-	36	-	-	50	-	-	-	-
<b>Background (With Toll Brothers Included)</b>	2	138	-	-	-	-	-	148	4	10	-	3
<b>Site Assignment</b>												
Commercial	48	51		-	-	-	-	-	-	-	-	-
Two Over Two Town Homes	9	5		-	-	-	-	-	-	-	-	-
Town Homes	17	10		-	2	-	-	4	-	-	-	-
<b>Site Total</b>	74	66		-	2	-	-	4	-	-	-	-
<b>Total Future (With Toll Brothers Included)</b>	2	140	-	-	-	-	-	152	4	10	-	3

# App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

6.: Oak Street/Cedar Avenue  
Trip Distribution

Traffic Component	Southbound Oak Street			Westbound Panther Place			Northbound Oak Street			Eastbound Cedar Avenue		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Pipeline Developments												
Novus Fairfax Gateway												
Paul VI - Redevelopment												
Toll Brothers - American Legion												
<b>Breezeway Site Development</b>												
Commercial												
Two Over Two Town Homes												
Town Homes												
		50%						-50%	-25%		25%	

6.: Oak Street/Cedar Avenue  
AM Peak Hour

2024

Traffic Component	Southbound Oak Street			Westbound Panther Place			Northbound Oak Street			Eastbound Cedar Avenue		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	4	81	33	36	8	31	29	82	1	9	29	20
Growth	-	2	1	1	-	1	1	2	-	-	1	1
Existing Adjusted	4	83	34	37	8	32	30	84	1	9	30	21
Pipeline Developments												
Novus Fairfax Gateway		117	214									
Paul VI - Redevelopment		71	141									
Toll Brothers - American Legion		26	48					24				
Subtotal	214	403		2	3	22	6	24	-	-	1	-
<b>Background (With Toll Brothers Included)</b>	4	99	35	39	11	54	36	108	1	9	31	21
<b>Site Assignment</b>												
Commercial	6	3										
Two Over Two Town Homes	2	8										
Town Homes	5	16						8	4	1		
<b>Site Total</b>	13	27						8	4	1		
<b>Total Future (With Toll Brothers Included)</b>	4	102	35	39	11	54	36	116	5	10	31	21

6.: Oak Street/Cedar Avenue  
PM Peak Hour

Traffic Component	Southbound Oak Street			Westbound Panther Place			Northbound Oak Street			Eastbound Cedar Avenue		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>	19	98	5	8	5	6	4	99	6	9	3	12
Growth	1	3	-	-	-	-	-	3	-	-	-	-
Existing Adjusted	20	101	5	8	5	6	4	102	6	9	3	12
Pipeline Developments												
Novus Fairfax Gateway		295	206									
Paul VI - Redevelopment		221	190									
Toll Brothers - American Legion		26	48					23				
Subtotal	542	444		1	1	13	21	23	-	-	2	-
<b>Background (With Toll Brothers Included)</b>	20	130	7	9	6	19	25	125	6	9	5	12
<b>Site Assignment</b>												
Commercial	48	51										
Two Over Two Town Homes	9	5										
Town Homes	17	10						5	3	4		
<b>Site Total</b>	74	66						5	3	4		
<b>Total Future (With Toll Brothers Included)</b>	20	139	7	9	6	19	25	130	9	13	5	12



# App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

A.: Commercial Drive/Fairfax Boulevard  
Trip Distribution

Traffic Component	Southbound None			Westbound Fairfax Boulevard			Northbound Commercial Drive			Eastbound Fairfax Boulevard		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Pipeline Developments												
Novus Fairfax Gateway				Assignment Per Novus Gateway TIA								
Paul VI - Redevelopment				Assignment Per Paul VI TIA								
Toll Brothers - American Legion				Assignment per Toll Brothers - American Legion TIA								
<b>Breezeway Site Development</b>												
Commercial												
Two Over Two Town Homes												
Town Homes												
					50%	45%		-45%	-5%		40%	-50%

A.: Commercial Drive/Fairfax Boulevard  
AM Peak Hour

2024

Traffic Component	Southbound None			Westbound Fairfax Boulevard			Northbound Commercial Drive			Eastbound Fairfax Boulevard		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>					644						1,731	
Growth	-	-	-	-	19	-	-	-	-	-	52	-
Existing Adjusted	-	-	-	-	663	-	-	-	-	-	1,783	-
Pipeline Developments		IN	OUT									
Novus Fairfax Gateway		117	214		22						50	
Paul VI - Redevelopment		71	141		48						33	
Toll Brothers - American Legion		26	48									
Subtotal		214	403		70						83	
<b>Background (With Toll Brothers Included)</b>					733						1,866	
<b>Site Assignment</b>												
Commercial	6	3				3	1			2		
Two Over Two Town Homes	2	8			1						4	
Town Homes	5	16										
Site Total	13	27			1	3	1			2	4	
<b>Total Future (With Toll Brothers Included)</b>					734	3	1			2	1,870	

A.: Commercial Drive/Fairfax Boulevard  
PM Peak Hour

Traffic Component	Southbound None			Westbound Fairfax Boulevard			Northbound Commercial Drive			Eastbound Fairfax Boulevard		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>					1,494						1,085	
Growth	-	-	-	-	45	-	-	-	-	-	33	-
Existing Adjusted	-	-	-	-	1,539	-	-	-	-	-	1,118	-
Pipeline Developments		IN	OUT									
Novus Fairfax Gateway		295	206		60						32	
Paul VI - Redevelopment		221	190		100						104	
Toll Brothers - American Legion		26	48									
Subtotal		542	444		160						136	
<b>Background (With Toll Brothers Included)</b>					1,699						1,254	
<b>Site Assignment</b>												
Commercial	48	51				22	23		3	19		
Two Over Two Town Homes	9	5			5						3	
Town Homes	17	10										
Site Total	74	66			5	22	23		3	19	3	
<b>Total Future (With Toll Brothers Included)</b>					1,704	22	23		3	19	1,257	

# App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

B: Walnut Street/Commercial RIRO Drive  
Trip Distribution

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Commercial RIRO Drive</u>			Northbound <u>Walnut Street</u>			Eastbound <u>None</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Pipeline Developments												
Novus Fairfax Gateway												
Paul VI - Redevelopment												
Toll Brothers - American Legion												
<b>Breezeway Site Development</b>												
Commercial												
Two Over Two Town Homes												
Town Homes												
		75%		-35%		-15%	15%		-75%			-25%

B: Walnut Street/Commercial RIRO Drive  
AM Peak Hour

2024

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Commercial RIRO Drive</u>			Northbound <u>Walnut Street</u>			Eastbound <u>None</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>												
Growth		75						116				
Existing Adjusted		2						3				
Pipeline Developments		77						119				
IN												
OUT												
Novus Fairfax Gateway	117	214										
Paul VI - Redevelopment	71	141	1					2				
Toll Brothers - American Legion	26	48										
Subtotal	214	403	1					2				
<b>Background (With Toll Brothers Included)</b>		78						121				
<b>Site Assignment</b>												
Commercial	6	3		1			1					
Two Over Two Town Homes	2	8						6				
Town Homes	5	16	1					4				
Site Total	13	27	3	1			1	10				
<b>Total Future (With Toll Brothers Included)</b>		81		1			1	131				

B: Walnut Street/Commercial RIRO Drive  
PM Peak Hour

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Commercial RIRO Drive</u>			Northbound <u>Walnut Street</u>			Eastbound <u>None</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>												
Growth		87						82				
Existing Adjusted		3						2				
Pipeline Developments		90						84				
IN												
OUT												
Novus Fairfax Gateway	295	206										
Paul VI - Redevelopment	221	190	2					1				
Toll Brothers - American Legion	26	48										
Subtotal	542	444	2					1				
<b>Background (With Toll Brothers Included)</b>		92						85				
<b>Site Assignment</b>												
Commercial	48	51		18		8	7					
Two Over Two Town Homes	9	5						4				
Town Homes	17	10	4					3				
Site Total	74	66	11	18		8	7	7				
<b>Total Future (With Toll Brothers Included)</b>		103		18		8	7	92				

# App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

C.: Walnut Street/Residential Drive  
Trip Distribution

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Residential Drive</u>			Northbound <u>Walnut Street</u>			Eastbound <u>None</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Pipeline Developments												
Novus Fairfax Gateway												
Paul VI - Redevelopment												
Toll Brothers - American Legion												
<b>Breezeway Site Development</b>												
Commercial		-15%								15%		
Two Over Two Town Homes			75%									
Town Homes		25%				-75%						-25%

C.: Walnut Street/Residential Drive  
AM Peak Hour

2024

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Residential Drive</u>			Northbound <u>Walnut Street</u>			Eastbound <u>None</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>		75						116				
Growth		2						3				
Existing Adjusted		77						119				
Pipeline Developments	IN	OUT										
Novus Fairfax Gateway	117	214										
Paul VI - Redevelopment	71	141	1					2				
Toll Brothers - American Legion	26	48										
Subtotal	214	403	1					2				
<b>Background (With Toll Brothers Included)</b>		78						121				
<b>Site Assignment</b>												
Commercial	6	3						1				
Two Over Two Town Homes	2	8	2	6		2	1					
Town Homes	5	16	1				4					
<b>Site Total</b>	13	27	1	6		2	1	5				
<b>Total Future (With Toll Brothers Included)</b>		79	2	6		2	1	126				

C.: Walnut Street/Residential Drive  
PM Peak Hour

Traffic Component	Southbound <u>Walnut Street</u>			Westbound <u>Residential Drive</u>			Northbound <u>Walnut Street</u>			Eastbound <u>None</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic Volume</b>		87						82				
Growth		3						2				
Existing Adjusted		90						84				
Pipeline Developments	IN	OUT										
Novus Fairfax Gateway	295	206										
Paul VI - Redevelopment	221	190	2					1				
Toll Brothers - American Legion	26	48										
Subtotal	542	444	2					1				
<b>Background (With Toll Brothers Included)</b>		92						85				
<b>Site Assignment</b>												
Commercial	48	51	8					7				
Two Over Two Town Homes	9	5	7	4		1	2					
Town Homes	17	10	4				3					
<b>Site Total</b>	74	66	12	4		1	2	10				
<b>Total Future (With Toll Brothers Included)</b>		104	7	4		1	2	95				

# App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included

D: Oak Street/Residential Drive  
Trip Distribution

Traffic Component	Southbound <u>Oak Street</u>			Westbound <u>Relocated American Legion Dwy</u>			Northbound <u>Oak Street</u>			Eastbound <u>Residential Drive</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
Pipeline Developments												
Novus Fairfax Gateway												
Paul VI - Redevelopment												
Toll Brothers - American Legion												
<b>Breezeway Site Development</b>												
Commercial												
Two Over Two Town Homes												
Town Homes	75%								25%	-25%		-75%

D: Oak Street/Residential Drive  
AM Peak Hour

2024

Traffic Component	Southbound <u>Oak Street</u>			Westbound <u>Relocated American Legion Dwy</u>			Northbound <u>Oak Street</u>			Eastbound <u>Residential Drive</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic + Relocated American Legion Traffic</b>		121	2	2		1	1	112				
Growth	-	4	-	-	-	-	-	3	-	-	-	-
Existing Adjusted	-	125	2	2	-	1	1	115	-	-	-	-
Pipeline Developments		IN	OUT									
Novus Fairfax Gateway		117	214									
Paul VI - Redevelopment		71	141									
Toll Brothers - American Legion		26	48		12	24		6	12			
Subtotal		214	403		12	24		8	18			
<b>Background (With Toll Brothers Included)</b>		147	18	14	-	25	9	133	-			
<b>Site Assignment</b>												
Commercial	6	3										
Two Over Two Town Homes	2	8										
Town Homes	5	16							1	4		12
Site Total	13	27							1	4		12
<b>Total Future (With Toll Brothers Included)</b>		147	18	14	-	25	9	133	1	4	-	12





















D: Oak Street/Residential Drive  
PM Peak Hour

Traffic Component	Southbound <u>Oak Street</u>			Westbound <u>Relocated American Legion Dwy</u>			Northbound <u>Oak Street</u>			Eastbound <u>Residential Drive</u>		
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
<b>Existing Traffic + Relocated American Legion Traffic</b>		113	4	5		-	1	109				
Growth	-	3	-	-	-	-	-	3	-	-	-	-
Existing Adjusted	-	116	4	5	-	-	1	112	-	-	-	-
Pipeline Developments		IN	OUT									
Novus Fairfax Gateway		295	206									
Paul VI - Redevelopment		221	190									
Toll Brothers - American Legion		26	48		11	23		21	11			
Subtotal		542	444		11	23		14	32			
<b>Background (With Toll Brothers Included)</b>		129	33	16	-	23	15	144	-			
<b>Site Assignment</b>												
Commercial	48	51										
Two Over Two Town Homes	9	5										
Town Homes	17	10							4	2		7
Site Total	74	66							4	2		7
<b>Total Future (With Toll Brothers Included)</b>		129	33	16	-	23	15	144	4	2	-	7

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Signalized Intersection Capacity Analysis

07/22/2021

1: Oak Street/Meredith Drive & Fairfax Boulevard

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1831	20	88	678	3	41	12	113	9	1	19
Future Volume (vph)	22	1831	20	88	678	3	41	12	113	9	1	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	4.6		5.6	4.6			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1597	3500		1805	3404			1829	1615		1705	
Flt Permitted	0.36	1.00		0.03	1.00			0.96	1.00		0.98	
Satd. Flow (perm)	605	3500		61	3404			1829	1615		1705	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	1990	22	96	737	3	45	13	123	10	1	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	114	0	20	0
Lane Group Flow (vph)	24	2012	0	96	740	0	0	58	9	0	12	0
Heavy Vehicles (%)	13%	3%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		4	4		7	7	
Permitted Phases	2			6					4			
Actuated Green, G (s)	129.7	125.3		143.4	132.4			11.5	11.5		6.5	
Effective Green, g (s)	131.7	127.3		144.4	134.4			13.5	13.5		8.5	
Actuated g/C Ratio	0.69	0.67		0.76	0.71			0.07	0.07		0.04	
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5	6.5		6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	447	2345		161	2407			129	114		76	
v/s Ratio Prot	0.00	c0.57		c0.04	0.22			c0.03			c0.01	
v/s Ratio Perm	0.04			0.41					0.01			
v/c Ratio	0.05	0.86		0.60	0.31			0.45	0.08		0.16	
Uniform Delay, d1	9.1	24.3		55.0	10.4			84.7	82.4		87.3	
Progression Factor	1.01	0.65		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	3.1		5.8	0.3			2.5	0.3		1.0	
Delay (s)	9.3	18.9		60.8	10.7			87.2	82.7		88.3	
Level of Service	A	B		E	B			F	F		F	
Approach Delay (s)		18.8			16.5			84.1			88.3	
Approach LOS		B			B			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			22.7									C
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			190.0							24.2		
Intersection Capacity Utilization			77.7%									D
Analysis Period (min)			15									
c Critical Lane Group												

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Signalized Intersection Capacity Analysis

2: Walnut Street/Fairchester Drive & Fairfax Boulevard

07/22/2021



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↗		↖	↑↗			↕		↖	↗	
Traffic Volume (vph)	10	1797	21	22	694	19	22	27	50	26	26	12
Future Volume (vph)	10	1797	21	22	694	19	22	27	50	26	26	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6			4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00			0.93		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1671	3500		1805	3397			1630		1752	1773	
Flt Permitted	0.34	1.00		0.06	1.00			0.93		0.38	1.00	
Satd. Flow (perm)	602	3500		119	3397			1526		702	1773	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1953	23	24	754	21	24	29	54	28	28	13
RTOR Reduction (vph)	0	0	0	0	0	0	0	23	0	0	9	0
Lane Group Flow (vph)	11	1976	0	24	775	0	0	84	0	28	32	0
Heavy Vehicles (%)	8%	3%	0%	0%	6%	0%	0%	5%	12%	3%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			7			3	
Permitted Phases	2			6			7			3		
Actuated Green, G (s)	145.0	142.2		147.8	143.6			23.9		12.5	12.5	
Effective Green, g (s)	147.0	143.2		149.8	144.6			25.9		14.5	14.5	
Actuated g/C Ratio	0.77	0.75		0.79	0.76			0.14		0.08	0.08	
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	487	2637		139	2585			208		53	135	
v/s Ratio Prot	0.00	c0.56		c0.00	0.23						0.02	
v/s Ratio Perm	0.02			0.13				c0.05		c0.04		
v/c Ratio	0.02	0.75		0.17	0.30			0.40		0.53	0.24	
Uniform Delay, d1	5.0	13.2		15.0	7.0			75.0		84.5	82.5	
Progression Factor	1.00	1.00		0.93	0.35			1.00		1.00	1.00	
Incremental Delay, d2	0.0	2.0		0.6	0.3			1.3		9.2	0.9	
Delay (s)	5.0	15.2		14.6	2.7			76.3		93.6	83.4	
Level of Service	A	B		B	A			E		F	F	
Approach Delay (s)		15.2			3.1			76.3			87.6	
Approach LOS		B			A			E			F	

Intersection Summary		
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.71	B
Actuated Cycle Length (s)	190.0	Sum of lost time (s)
Intersection Capacity Utilization	71.1%	20.7
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis

07/22/2021

















3: Walnut Street & Cedar Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	0	0	8	0	28	6	99	29	34	46	1
Future Volume (vph)	1	0	0	8	0	28	6	99	29	34	46	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	0	9	0	30	7	108	32	37	50	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1	39	147	88								
Volume Left (vph)	1	9	7	37								
Volume Right (vph)	0	30	32	1								
Hadj (s)	0.23	-0.38	-0.09	0.11								
Departure Headway (s)	4.7	4.0	4.0	4.2								
Degree Utilization, x	0.00	0.04	0.16	0.10								
Capacity (veh/h)	726	843	882	834								
Control Delay (s)	7.7	7.2	7.8	7.7								
Approach Delay (s)	7.7	7.2	7.8	7.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.7									
Level of Service			A									
Intersection Capacity Utilization			25.0%	ICU Level of Service	A							
Analysis Period (min)			15									

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis

07/22/2021

4: Walnut Street & Second Street

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	9	9	2	2	4	2	114	3	3	53	2
Future Volume (vph)	13	9	9	2	2	4	2	114	3	3	53	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	10	10	2	2	4	2	124	3	3	58	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	34	8	129	63								
Volume Left (vph)	14	2	2	3								
Volume Right (vph)	10	4	3	2								
Hadj (s)	-0.06	-0.22	0.02	0.02								
Departure Headway (s)	4.3	4.1	4.1	4.1								
Degree Utilization, x	0.04	0.01	0.15	0.07								
Capacity (veh/h)	804	825	862	852								
Control Delay (s)	7.4	7.2	7.8	7.5								
Approach Delay (s)	7.4	7.2	7.8	7.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			16.8%	ICU Level of Service								A
Analysis Period (min)			15									



5: Oak Street & Second Street



















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	1	7	2	127	165	3
Future Volume (vph)	1	7	2	127	165	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	8	2	138	179	3
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	9	140	182			
Volume Left (vph)	1	2	0			
Volume Right (vph)	8	0	3			
Hadj (s)	-0.48	0.04	0.02			
Departure Headway (s)	4.1	4.1	4.1			
Degree Utilization, x	0.01	0.16	0.21			
Capacity (veh/h)	800	854	873			
Control Delay (s)	7.1	7.9	8.1			
Approach Delay (s)	7.1	7.9	8.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.0			
Level of Service			A			
Intersection Capacity Utilization			18.9%	ICU Level of Service	A	
Analysis Period (min)			15			

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis

07/22/2021

6: Oak Street & Cedar Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	31	10	54	11	39	5	116	36	35	102	4
Future Volume (vph)	21	31	10	54	11	39	5	116	36	35	102	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	34	11	59	12	42	5	126	39	38	111	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	68	113	170	153								
Volume Left (vph)	23	59	5	38								
Volume Right (vph)	11	42	39	4								
Hadj (s)	0.00	-0.08	-0.10	0.07								
Departure Headway (s)	4.8	4.7	4.4	4.6								
Degree Utilization, x	0.09	0.15	0.21	0.20								
Capacity (veh/h)	686	713	772	738								
Control Delay (s)	8.3	8.5	8.6	8.7								
Approach Delay (s)	8.3	8.5	8.6	8.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			35.6%	ICU Level of Service	A							
Analysis Period (min)			15									

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis  
 101: Site Driveway A & Fairfax Boulevard

07/22/2021



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	1870	2	3	734	0	1
Future Volume (Veh/h)	1870	2	3	734	0	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2033	2	3	798	0	1
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	250		387			
pX, platoon unblocked			0.66		0.70	0.66
vC, conflicting volume			2035		2439	1018
vC1, stage 1 conf vol					2034	
vC2, stage 2 conf vol					405	
vCu, unblocked vol			1531		1683	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			283		106	712
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>WB 3</b>	<b>NB 1</b>
Volume Total	1355	680	3	399	399	1
Volume Left	0	0	3	0	0	0
Volume Right	0	2	0	0	0	1
cSH	1700	1700	283	1700	1700	712
Volume to Capacity	0.80	0.40	0.01	0.23	0.23	0.00
Queue Length 95th (ft)	0	0	1	0	0	0
Control Delay (s)	0.0	0.0	17.9	0.0	0.0	10.1
Lane LOS	C			B		
Approach Delay (s)	0.0		0.1			10.1
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			61.8%	ICU Level of Service	B	
Analysis Period (min)			15			

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis  
 102: Walnut Street & Site Driveway B










07/22/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	1	131	1	0	81
Future Volume (Veh/h)	0	1	131	1	0	81
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	142	1	0	88
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						131
pX, platoon unblocked	0.99					
vC, conflicting volume	230	142			143	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216	142			143	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	763	905			1440	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	1	143	88			
Volume Left	0	0	0			
Volume Right	1	1	0			
cSH	905	1700	1700			
Volume to Capacity	0.00	0.08	0.05			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	9.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			17.0%		ICU Level of Service	A
Analysis Period (min)			15			

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis  
 103: Walnut Street & Site Driveway C

















07/22/2021

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	6	126	1	2	79
Future Volume (Veh/h)	2	6	126	1	2	79
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	7	137	1	2	86
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						264
pX, platoon unblocked	1.00					
vC, conflicting volume	228	138			138	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	225	138			138	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	761	911			1446	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	138	88			
Volume Left	2	0	2			
Volume Right	7	1	0			
cSH	873	1700	1446			
Volume to Capacity	0.01	0.08	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	9.2	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			16.7%		ICU Level of Service	A
Analysis Period (min)			15			

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis

104: Oak Street & Site Driveway D/Relocated American Legion Dwy

07/22/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	4	25	0	14	1	133	9	18	147	4
Future Volume (Veh/h)	12	0	4	25	0	14	1	133	9	18	147	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	0	4	27	0	15	1	145	10	20	160	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	369	359	162	358	356	150	164			155		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	369	359	162	358	356	150	164			155		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	95	100	98	100			99		
cM capacity (veh/h)	571	559	883	588	561	896	1414			1425		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	17	42	156	184								
Volume Left	13	27	1	20								
Volume Right	4	15	10	4								
cSH	623	670	1414	1425								
Volume to Capacity	0.03	0.06	0.00	0.01								
Queue Length 95th (ft)	2	5	0	1								
Control Delay (s)	10.9	10.7	0.1	0.9								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.9	10.7	0.1	0.9								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			29.9%		ICU Level of Service				A			
Analysis Period (min)			15									

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Signalized Intersection Capacity Analysis

1: Oak Street/Meredith Drive & Fairfax Boulevard

07/22/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↕	↗		↕	
Traffic Volume (vph)	33	1224	25	116	1685	0	23	4	119	15	9	19
Future Volume (vph)	33	1224	25	116	1685	0	23	4	119	15	9	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	4.6		5.6	4.6			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1597	3496		1805	3406			1821	1615		1756	
Flt Permitted	0.08	1.00		0.15	1.00			0.96	1.00		0.98	
Satd. Flow (perm)	132	3496		284	3406			1821	1615		1756	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	1330	27	126	1832	0	25	4	129	16	10	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	122	0	14	0
Lane Group Flow (vph)	36	1357	0	126	1832	0	0	29	7	0	33	0
Heavy Vehicles (%)	13%	3%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		4	4		7	7	
Permitted Phases	2			6					4			
Actuated Green, G (s)	161.9	155.7		171.5	160.5			9.6	9.6		8.5	
Effective Green, g (s)	163.9	157.7		173.5	162.5			11.6	11.6		10.5	
Actuated g/C Ratio	0.75	0.72		0.79	0.74			0.05	0.05		0.05	
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5	6.5		6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	146	2505		306	2515			96	85		83	
v/s Ratio Prot	0.01	0.39		c0.02	c0.54			c0.02			c0.02	
v/s Ratio Perm	0.18			0.30					0.00			
v/c Ratio	0.25	0.54		0.41	0.73			0.30	0.08		0.39	
Uniform Delay, d1	16.2	14.4		11.0	16.3			100.3	99.1		101.7	
Progression Factor	0.91	0.63		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.8	0.8		0.9	1.9			1.8	0.4		3.1	
Delay (s)	15.5	9.8		11.9	18.2			102.1	99.5		104.7	
Level of Service	B	A		B	B			F	F		F	
Approach Delay (s)		9.9			17.8			100.0			104.7	
Approach LOS		A			B			F			F	

Intersection Summary		
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.66	B
Actuated Cycle Length (s)	220.0	Sum of lost time (s)
Intersection Capacity Utilization	73.8%	24.2
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		D

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Signalized Intersection Capacity Analysis

2: Walnut Street/Fairchester Drive & Fairfax Boulevard

07/22/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1204	19	28	1665	14	36	30	38	36	24	14
Future Volume (vph)	22	1204	19	28	1665	14	36	30	38	36	24	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6			4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00			0.95		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1671	3498		1805	3403			1679		1752	1762	
Flt Permitted	0.08	1.00		0.17	1.00			0.88		0.47	1.00	
Satd. Flow (perm)	147	3498		326	3403			1498		867	1762	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	1309	21	30	1810	15	39	33	41	39	26	15
RTOR Reduction (vph)	0	0	0	0	0	0	0	10	0	0	10	0
Lane Group Flow (vph)	24	1330	0	30	1825	0	0	103	0	39	31	0
Heavy Vehicles (%)	8%	3%	0%	0%	6%	0%	0%	5%	12%	3%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			7			3	
Permitted Phases	2			6			7			3		
Actuated Green, G (s)	172.1	166.4		172.1	166.4			28.2		18.8	18.8	
Effective Green, g (s)	174.1	167.4		174.1	167.4			30.2		20.8	20.8	
Actuated g/C Ratio	0.79	0.76		0.79	0.76			0.14		0.09	0.09	
Clearance Time (s)	6.6	6.6		6.6	6.6			6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	162	2661		303	2589			205		81	166	
v/s Ratio Prot	c0.00	0.38		0.00	c0.54						0.02	
v/s Ratio Perm	0.11			0.08				c0.07		0.04		
v/c Ratio	0.15	0.50		0.10	0.70			0.50		0.48	0.19	
Uniform Delay, d1	12.5	10.1		6.8	13.6			87.9		94.5	91.8	
Progression Factor	1.00	1.00		0.09	0.36			1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.7		0.1	1.2			1.9		4.5	0.5	
Delay (s)	12.9	10.8		0.7	6.1			89.8		98.9	92.4	
Level of Service	B	B		A	A			F		F	F	
Approach Delay (s)		10.9			6.0			89.8			95.6	
Approach LOS		B			A			F			F	

















Intersection Summary		
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.67	B
Actuated Cycle Length (s)	220.0	Sum of lost time (s)
Intersection Capacity Utilization	67.4%	20.7
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C



App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis

07/22/2021

















3: Walnut Street & Cedar Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	0	3	18	0	18	1	76	14	24	79	2
Future Volume (vph)	3	0	3	18	0	18	1	76	14	24	79	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	0	3	20	0	20	1	83	15	26	86	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	6	40	99	114								
Volume Left (vph)	3	20	1	26								
Volume Right (vph)	3	20	15	2								
Hadj (s)	-0.17	-0.17	-0.05	0.07								
Departure Headway (s)	4.2	4.2	4.1	4.2								
Degree Utilization, x	0.01	0.05	0.11	0.13								
Capacity (veh/h)	801	813	863	848								
Control Delay (s)	7.3	7.4	7.6	7.8								
Approach Delay (s)	7.3	7.4	7.6	7.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			22.3%	ICU Level of Service	A							
Analysis Period (min)			15									

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis

07/22/2021

4: Walnut Street & Second Street

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	11	3	0	5	1	6	78	1	3	101	2
Future Volume (vph)	1	11	3	0	5	1	6	78	1	3	101	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	12	3	0	5	1	7	85	1	3	110	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	16	6	93	115								
Volume Left (vph)	1	0	7	3								
Volume Right (vph)	3	1	1	2								
Hadj (s)	-0.07	-0.07	0.04	0.03								
Departure Headway (s)	4.3	4.3	4.1	4.1								
Degree Utilization, x	0.02	0.01	0.11	0.13								
Capacity (veh/h)	796	794	858	873								
Control Delay (s)	7.4	7.3	7.6	7.7								
Approach Delay (s)	7.4	7.3	7.6	7.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			16.9%	ICU Level of Service								A
Analysis Period (min)			15									

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis

07/22/2021

5: Oak Street & Second Street



















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	3	10	4	152	140	2
Future Volume (vph)	3	10	4	152	140	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	4	165	152	2
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	14	169	154			
Volume Left (vph)	3	4	0			
Volume Right (vph)	11	0	2			
Hadj (s)	-0.39	0.04	0.03			
Departure Headway (s)	4.2	4.1	4.1			
Degree Utilization, x	0.02	0.19	0.18			
Capacity (veh/h)	785	857	862			
Control Delay (s)	7.3	8.1	8.0			
Approach Delay (s)	7.3	8.1	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.0			
Level of Service			A			
Intersection Capacity Utilization			21.2%	ICU Level of Service	A	
Analysis Period (min)			15			

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis

07/22/2021

6: Oak Street & Cedar Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	5	13	19	6	9	9	130	25	7	139	20
Future Volume (vph)	12	5	13	19	6	9	9	130	25	7	139	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	5	14	21	7	10	10	141	27	8	151	22
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	32	38	178	181								
Volume Left (vph)	13	21	10	8								
Volume Right (vph)	14	10	27	22								
Hadj (s)	-0.15	-0.01	-0.05	-0.03								
Departure Headway (s)	4.6	4.7	4.2	4.2								
Degree Utilization, x	0.04	0.05	0.21	0.21								
Capacity (veh/h)	715	699	830	832								
Control Delay (s)	7.8	8.0	8.3	8.4								
Approach Delay (s)	7.8	8.0	8.3	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			21.8%	ICU Level of Service	A							
Analysis Period (min)			15									

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis  
 101: Site Driveway A & Fairfax Boulevard










07/22/2021



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	1257	19	22	1704	3	23
Future Volume (Veh/h)	1257	19	22	1704	3	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1366	21	24	1852	3	25
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage veh)	2		2			
Upstream signal (ft)	250		387			
pX, platoon unblocked			0.85		0.76	0.85
vC, conflicting volume			1387		2350	694
vC1, stage 1 conf vol					1376	
vC2, stage 2 conf vol					974	
vCu, unblocked vol			1106		1259	291
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			96		99	96
cM capacity (veh/h)			534		230	601
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	911	476	24	926	926	28
Volume Left	0	0	24	0	0	3
Volume Right	0	21	0	0	0	25
cSH	1700	1700	534	1700	1700	512
Volume to Capacity	0.54	0.28	0.04	0.54	0.54	0.05
Queue Length 95th (ft)	0	0	4	0	0	4
Control Delay (s)	0.0	0.0	12.1	0.0	0.0	12.4
Lane LOS			B			B
Approach Delay (s)	0.0		0.2			12.4
Approach LOS						B
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			57.1%	ICU Level of Service	B	
Analysis Period (min)			15			

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis  
 102: Walnut Street & Site Driveway B

07/22/2021

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	18	92	7	0	103
Future Volume (Veh/h)	8	18	92	7	0	103
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	20	100	8	0	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						145
pX, platoon unblocked	0.99					
vC, conflicting volume	216	104			108	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	206	104			108	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			100	
cM capacity (veh/h)	776	951			1483	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	29	108	112			
Volume Left	9	0	0			
Volume Right	20	8	0			
cSH	889	1700	1700			
Volume to Capacity	0.03	0.06	0.07			
Queue Length 95th (ft)	3	0	0			
Control Delay (s)	9.2	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.2	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			15.4%		ICU Level of Service	A
Analysis Period (min)			15			

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis  
 103: Walnut Street & Site Driveway C

07/22/2021



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	4	95	2	7	104
Future Volume (Veh/h)	1	4	95	2	7	104
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	4	103	2	8	113
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	233	104			105	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	233	104			105	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	751	951			1486	
<b>Direction, Lane #</b>						
	WB 1	NB 1	SB 1			
Volume Total	5	105	121			
Volume Left	1	0	8			
Volume Right	4	2	0			
cSH	903	1700	1486			
Volume to Capacity	0.01	0.06	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	9.0	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	0.5			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		21.2%		ICU Level of Service		A
Analysis Period (min)			15			

App F: Alt Analysis w/ Potential American Legion (Toll Brothers) & Potential Bike Lane on Walnut Street Included  
 HCM Unsignalized Intersection Capacity Analysis

104: Oak Street & Site Driveway D/Relocated American Legion Dwy

07/22/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	2	23	0	16	4	144	15	33	129	13
Future Volume (Veh/h)	7	0	2	23	0	16	4	144	15	33	129	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	0	2	25	0	17	4	157	16	36	140	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	409	400	147	394	399	165	154			173		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	409	400	147	394	399	165	154			173		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	95	100	98	100			97		
cM capacity (veh/h)	530	523	900	552	524	879	1426			1404		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	42	177	190								
Volume Left	8	25	4	36								
Volume Right	2	17	16	14								
cSH	578	650	1426	1404								
Volume to Capacity	0.02	0.06	0.00	0.03								
Queue Length 95th (ft)	1	5	0	2								
Control Delay (s)	11.3	10.9	0.2	1.6								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.3	10.9	0.2	1.6								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			31.4%		ICU Level of Service				A			
Analysis Period (min)			15									